

Improving Patient Flow in the NHS

Case studies on reducing delays



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What is it about?

Through applying the improvement principles of capacity and demand management to a radiology department, waits for barium enemas and computerised tomography (CT) were reduced dramatically.

How will it help achieve 18 weeks?

By reducing bottlenecks in the diagnostic part of the pathway.

What was the problem?

The problem was identified in the hospital's radiology service in the diagnostic stage of the patient journey. This was contributing to a 19 week wait for a barium enema, causing long waiting lists to develop. There was a similar problem in the service with delay and long waiting lists for CT scanning.

What they did to identify the cause of the problem

The hospital Trust joined the Improvement Partnership for Hospitals programme in April 2003. As part of the organisation's wider programme to improve emergency, orthopaedic and outpatient care, the improvement team focused on radiology improvement. Alongside the portfolio of work, tackling issues in these key work streams, their efforts were supported by organisational development, a better use and understanding of operational logistics information and changes in the way the Trust was managed. The overarching goal was to transform the whole care system.

The service improvement team targeted waits from the beginning, using process mapping exercises to reveal variation between demand and capacity in radiology services.

What they did to improve service

Process mapping exercises across the Trust identified several areas in the system that needed to be addressed in order to reduce the wait for a barium enema:

- eliminating 'carve out'. Weekly slots had previously been divided between routine, inpatient and urgent requests without regard for demand
- covering all sessions, rather than having unfilled slots
- training radiographers to perform barium enemas to address the shortage in radiologists
- introducing flexibility
- introducing protocols for checking requests to avoid delay
- giving individual appointment times rather than group booking times
- only booking barium examinations onto lists, rather than many different examinations
- introducing measures and targets where there had previously been none.

Through a similar process of improvement, the Trust has improved access to CT scans. It has also used the methodology to reduce the strain on the radiology department in the demand for viewing films that had not been carried out by clinicians.



What is it like now?

A reduction in waiting times in the diagnostic stage of a patient's journey (barium enema) from 19 weeks to 2 weeks over a 5 month period was achieved by applying principles of capacity and demand management. Waiting times for scanning have been reduced from six weeks to three weeks.

However, reducing waiting lists has not completed the work of the service improvement team on the radiology work stream. The team are now developing staff roles, from radiographers to clerks, and redesigning the administrative system to support improvements. These improvements are being monitored continuously to identify their impact on the rest of the hospital to ensure that they are being sustained, and to find ways of boosting them further.

Key points

Adopting the principles of capacity and demand management addressed a number of different problems in one department. The team were part of a strategic programme across the Trust to improve the whole care system, giving validity and support to their work.

Tips for implementation

Additional resources:

- Variation
- Discharge Planning
- Process Mapping
- Role Redesign
- Overview of Patient Flow
- Comprehensive Guide to Demand and Capacity
- Quick Introduction to Demand and Capacity
- Managing Bottlenecks

Acknowledgements / sources

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Bolton Abdominal Pain - Use of Problem Solving Techniques

02

What is it about?

During a value stream analysis event (VSA), the team did a root cause analysis of potential obstacles to the implementation of the future state process for patients with abdominal pain using '5 whys' and '5 hows' methodology.

How will it help achieve 18 weeks?

Reducing unnecessary admissions for abdominal pain, as well as rework in following up those who are brought back for diagnostics and review in outpatients, will create more capacity to reduce delay for other patients.

What was the problem?

Following the Trust value stream analysis event in October 2006, the abdominal pain value stream was identified as a priority. At Bolton Hospital, management of abdominal pain wasn't standardised; there was a perception that the patient journey was delayed by a lack of access to diagnostics and clinical decision making at appropriate points in the pathway. It was also believed that some admissions could be avoided and that there was a lot of rework in following up patients who were brought back for diagnostics and review. The process for clinical coding may also have been impacting on income streams and clinical data tracking. This value stream analysis was conducted in February 2007.

What they did to identify the cause of the problem

A team of more than 25 staff from different departments and disciplines conducted the value stream analysis. The scope included all adult patients with abdominal pain presenting as an emergency to Bolton Hospital A & E department or assessment units, up to the point of discharge from hospital.

The current state map showed that patients were repeatedly moving wards and visiting departments for diagnostic procedures, causing unnecessary movement and delays. The team decided one of the headlines should be 'Doctors Walk Miles and Lose their Patients and their Patience', with another headline being 'No Beds at the Inn'.

Weekends were highlighted as a cause of delayed patient progress.

Overall flow time ranged from 0.2-24 days. There were 121 information handoffs and patients travelled 2300 metres.

What they did to improve service

After considering the ideal state, the team decided the key elements for inclusion in the future state were:

- prompt pain relief
- single entry point
- immediate diagnostics (tests and diagnosticians)
- simple electronic patient record.

The team also did a root cause analysis of potential obstacles to the implementation of the future state using '5 whys' and '5 hows' methodology (see photograph 1).

Coloured post-it notes were used to highlight:

- problems – green
- why they were problems – yellow
- how the problems would be resolved – green.

Photograph 1. Root cause analysis using fishbone technique



The team then identified the top 10 requirements to make the future state a reality:

- effective leadership
- clear communication
- standard working practices
- seven day week for all services
- quick, effective discharges
- patients: right place, first time, stay there
- best multi-disciplinary team work
- quick, effective diagnosis
- easily accessible diagnostic equipment
- accessible user friendly patient records.

What is it like now?

The team identified many overall benefits to be gained by implementation of the future state including:

- reduced infection risk, morbidity and mortality and associated costs as a result of less delays and patient movement
- less staff time spent chasing and replicating requests for diagnostic tests or diagnosticians and managing patients through the existing complicated processes
- less inappropriate admissions due to delays in diagnosis
- reduced length of stay and associated costs.

The team then created a model based on the introduction of ultrasound scanning in the immediate assessment phase. The estimated savings in associated costs of beds was £4million.

Next steps

- Planning and implementation events to achieve specifics of the future state for the abdominal pain value stream.
- Involvement in rapid improvement events with other clinical value streams to achieve aspects of future state that are common to all.
- Implementation of projects - outpatient booking, care bundles and diagnostics.

Key points

Using problem solving methodology in a systematic way really helps to identify what the problems are, to understand why they are problems and agree collectively how to overcome them.

Tips for implementation

- Involve as many relevant people as possible in the VSA, including commissioners etc.
- Maintain a core team to manage the value stream towards the future state.
- Make sure improvements and future state implementation is data driven, not based on political motivation or anecdotal information.

Additional resources

Acknowledgements / sources

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What is it about?

A value stream analysis event was held to focus on mapping the current process state for simple joint replacement: from the patient choosing Bolton Hospital, through to discharge. The analysis outlined opportunities for improvement to increase productivity and enhance patient experience.

How will it help achieve 18 weeks?

Improving processes and eliminating waste from the pathway of a simple joint replacement improves the process for all other orthopaedic conditions and creates a future state in which waiting lists are no longer an issue.

What was the problem?

The Trust enterprise value stream analysis identified joint surgery as one of the high volume cases for the Trust (within the simple category). Orthopaedic services at the Trust were facing depleting referrals due to ICATs and independent treatment centres (ITCs). They also had a longer than average length of stay (LoS) and higher infection rates.

What they did to identify the cause of the problem

A week long value stream analysis event was held to map the journey of a simple lower joint replacement: from the patient choosing Bolton Hospital, through to discharge. A multi-disciplinary team was formed comprising front line clinicians and a facilitator from the Bolton Improving Care System (BICS). The team conducted the value stream analysis to understand the current process. This then informed the creation of a new process (future state) based on what the patient values. The team mapped the pathway and found that there were over 300 steps, many of which were duplicated. There were many examples of waste in the system, such as unnecessary waiting and much double checking. For example, a patient could potentially have three x-rays when one was sufficient. A total of 377 people interactions were involved in the process: it actually took one patient 26 weeks to travel through the pathway.

What they did to improve service

The team developed a detailed future state process which removed waste from the current system. The aim was to reduce the number of handoffs where there was a potential for error. From designing an ideal state, the team based the new process on key themes:

- patient centred, a safe system with no defects or hospital errors
- happy staff
- patients greeted personally and treated as individuals
- calm, clean and orderly. Minimally invasive
- no waiting: a one stop shop with no unnecessary motion.

A series of rapid improvement events were planned to support the move to the future state model.
February 2007 – theatre RIE
April 2007 – ward RIE: considering implications of reducing LoS to 5 days
May 2007 – 6s anaesthetic room / recovery / implant storage
June 2007 – outpatient/pre-op assessment RIE

A communication plan was also developed to communicate findings to ALL staff within the value stream.

What is it like now?

The theatre rapid improvement event took place in February. The aim was to minimise the number of steps in the theatre process for joint replacements by reducing checks, duplication and handoffs, as well as implementing standard work and visual management in theatres.

Scope: a lower limb joint replacement from ward through to theatre and back to the ward. Improvements to the process during the event resulted in theatre lists starting on time, a reduction in surgery time and a reduced risk of infection by minimising movement in theatre and from ward to ward. The team calculated the potential for increasing productivity by doing more with the same. They established that five joints could be done on one list with the same staff working an elongated theatre day from 8.00am to 5.30pm.

It was established that five joints are added to the waiting list per week. Therefore, if one list per week deals with new additions, the other three lists can work down the waiting list backlog. There were 175 patients on the list, so it would take 11.6 weeks to clear. The Trust would then be in an excellent position to compete for new business and be more competitive than the independent sector. The requirements for wards now need to be assessed.

Key points

- The importance of all members of the current process understanding the process and what adds value for patients.
- The need for dedicated time to do the mapping and the right facilitation. It takes time to plan and take the improvement work forward.

Tips for implementation

Communicate, communicate, communicate!

Additional resources

Value Stream Mapping
Spaghetti Diagrams
Balanced Scorecard of Measures
Future State Impact Measures

Acknowledgements / sources

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What is it about?

The Bolton Improving Care System (BICS) is a specific approach to service improvement using Lean methodologies aligned to delivering best possible care - one of the four aims of service delivery at Royal Bolton Hospital.

How will it help achieve 18 weeks?

BICS is about identifying and removing non-added value work from hospital processes (waste), increasing quality of care, efficiency and productivity to reduce delays and improve clinical outcomes - all essential ingredients in achieving the 18 week patient journey. BICS is owned and delivered by the staff, creating true organisational teamwork.

What was the problem?

Bolton Hospital had a good track record of service improvement, but realised that it needed to continue improving performance to address its current pressures: achieving 18 weeks, maintaining competitive advantage and being the provider of choice for the local population. The hospital teams knew there was more they could do to reduce mortality rates and lower length of stay. They also believed that these improvements were sustainable.

What they did to identify the cause of the problem

During 2005/6, the hospital had been applying an approach called Lean to improve the quality of service for patients. This generated lots of activity and enthusiasm, with some great early results. It also highlighted the need to:

- involve ALL staff
- accelerate the pace of change and make changes sustainable
- embed a practical approach to improvement and apply it to the top priorities.

To equip the Trust to deliver best possible care in the 21st century, the Trust Board wanted to shape the next phase of Lean work and make longer term improvement plans with frontline staff.

In October 2006, a visioning event involving nearly 60 people, including senior managers and clinical leaders, Staff Side, partner organisations and the Patient and Public Involvement Forum, took place. The event was facilitated by the Trust's consultancy partner who provided Lean expertise.

During the event, groups took an intensive and practical look at the major high volume value streams in the Trust. They analysed what actually happens to patients in the patient pathways. This made it extremely clear to all who took part how complicated the pathways were, even for day case and short stay procedures - and how much improvement was required.

What they did to improve service

Teams thought about how processes should be redesigned for the future with higher quality and safety, offering better value for money and improved access and efficiency, making the hospital a better place for staff to work.

Teams grouped pathways into simple or complex.

Simple pathways – for patients with a stable medical or social condition who need one specialty / discipline for treatment; for one condition involving minimal contact with other agencies.

Complex pathways – for patients who need more than one specialty / discipline for treatment; have multiple clinical conditions and require another / multiple agencies to be involved.

The output of this work then formed the framework for the Trust's improvement plan 2007-08. Participants agreed to focus on the following patient pathways:

- cataracts (simple)
- joint problems (simple)
- adult stroke (complex)
- abdominal pain (simple and complex).

Work will continue in some of the support services such as diagnostics, laundry, human resources and other support functions.

Each of the priority value streams will conduct more detailed value stream analyses which will then lead to the development of an annual plan of rapid improvement events and just do its / stop its and additional projects.

This was agreed with divisions and the Trust Board and shown on the BICS 2007-08 year plan, although action actually started in December 2006.

Learning from others

Bolton Hospital has also developed partnerships with other organisations that have a track record of using Lean to improve their services, such as US healthcare providers Virginia Mason and Thedacare, the UK RAF and Navy and UK manufacturing companies such as Markem and Toyota.

They are not all public sector or service organisations, but the hospital has learned a lot about how they have involved staff in improving services, how they have sustained changes and how they have kept on seeking better ways of working to continuously improve. Staff from some of these organisations have participated in rapid improvement events at Bolton NHS Trust and their 'fresh eyes' and experience of Lean improvement have been invaluable.

Communication with staff and partners was considered key, so regular BICS internal mini conferences and rapid improvement events where face to face communication takes place to update staff on progress were established. These are supported by a newsletter. BICS information is also available on the hospital intranet.

The hospital also has a strong internal BICS team who support the improvement work across the Trust.

What is it like now?

There is a great deal of energy within the Trust and the future state plan is in the process of being implemented.

Key points

Be realistic and patient - it's a long term journey.

Rapid improvement event methodology means that many improvements do happen more quickly than they would normally, whilst the engagement of frontline staff further enables change to proceed more rapidly than usual.

The rapid improvement event cycle also ensures that staff can see 'this is the way we do things' and staff are coached to work this way.

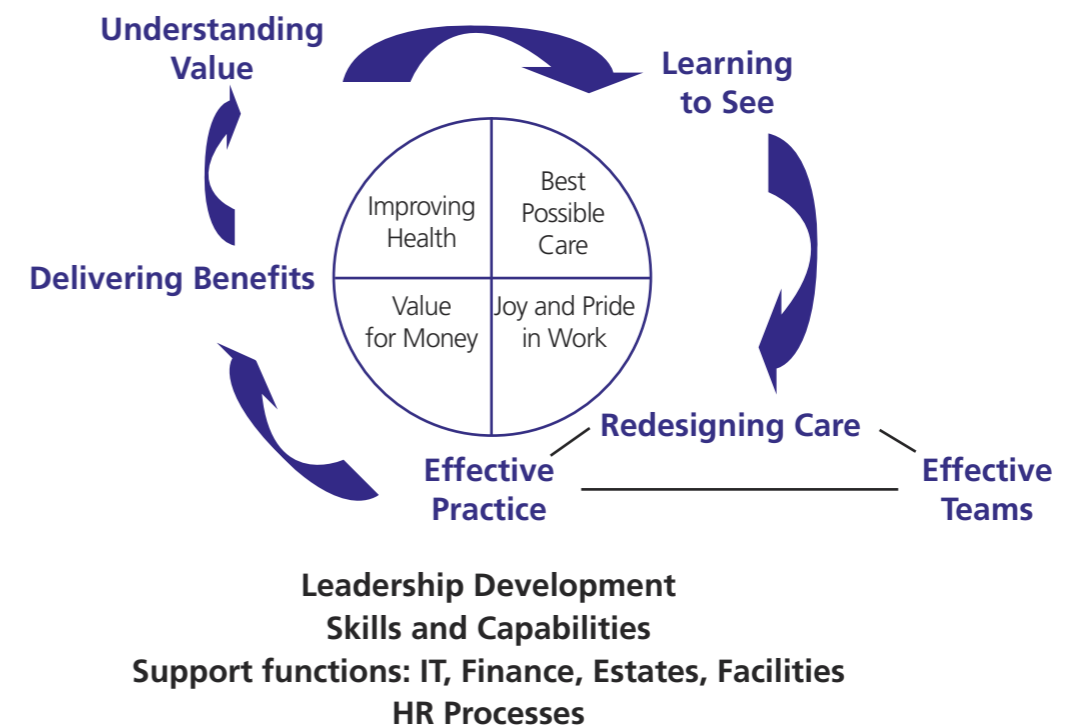
Tips for implementation

Ensure that:

- you consistently follow clear methodology that is easy to understand for your teams
- all staff are involved and have ownership
- good learning transfer for the teams in the methods prior to, during and after the rapid improvement events.

Additional resources

The model developed at Bolton which underpins the Bolton Improving Care System.



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What is it about?

A template and process to base pathway redesign on evidence taken from actual patient journeys which are breaching the 18 week RTT (referral to treatment). This is particularly useful for unusual or multi-entry pathways, or where patients have complex lives.

How will it help achieve 18 weeks?

It helps gain an understanding of the pathways and the patient journeys for specific patient groups. It also informs the debate with clinical staff as it bases the existing pathway on the evidence of actual patient journeys taken from case notes. It is designed to improve services for patients who are often unable to cope with structured, less flexible pathways.

What was the problem?

Due to the nature of hepatitis patients' journeys; with some patients of no fixed abode, many having substance abuse problems and some having multiple pathology, there were no clear patient pathways. Patients often breached, but it was difficult to determine why, given the variability of the pathways and the nature of the complex lives of the patients. Patients often did not attend, were not compliant and were non contactable.

What they did to identify the cause of the problem

A random selection of six hepatology case notes were reviewed and each pathway was detailed on a bespoke breach analysis form. These were then summarised on a breach analysis summary form to evaluate trends and patterns. This breach analysis form uses a similar format to a lung cancer breach analysis model.

This enabled the Trust to clearly identify bottlenecks and work out the current average length of patient pathway.

What they did to improve service

Patients previously saw a consultant, then had tests prior to being seen again by the consultant. They were then booked with a clinical nurse specialist who arranged the specialist drug treatment after consultation with the patient, explaining how the aggressive treatment could affect their life.

Having this detailed information from the breach analysis forms allowed the pathway to be mapped and redesigned around the patients' requirements. This included moving the patients' appointments with the clinical nurse specialists to the start of the pathway to work up tests etc. and also to help guide the patients through the redesigned pathway.

The redesigned pathway is now based on best practice and is set up in the best interests of the patients using this service.

What is it like now?

The pathway is now designed in such a way as to meet the needs of this patient group, thus giving them a more appropriate and improved service. Patients have a greater understanding of the treatment regime, its consequences and the impact upon their lives.

Patients are seen by the clinical nurse specialist at the start of the journey (it is they who will work up tests) to counsel patients on the respective treatments and its effects. Patients are then referred to the consultant who is able to make a fully informed decision on treatment, based on the outcomes of the tests and valuable input from the clinical nurse specialist who has had the opportunity to spend some time with each patient.

The clinical nurse specialist is a single point of contact for the patients from the commencement of the pathway. The pathway has also been shortened by approximately ten weeks, helping the Trust achieve 18 weeks RTT. By shortening the pathway significantly, patients are less likely to be 'lost' due to the lengthy pathway and their often chaotic lifestyles.

Key points

The breach analysis tools will work for other pathways and have been used effectively by the Trust for specialties such as carpal tunnel pathways within plastic surgery, although it may not be as effective a tool for larger volume, less multi-factorial pathways.

Caution should be exercised when analysing any pathway based on a small number of patients unless other evidence or tools are used.

It was extremely powerful to base structured arguments and discussions on evidence using these breach analysis templates when working with clinical colleagues in the redesign of patient pathways.

Tips for implementation

- Involve and communicate with people who will be directly involved in the pathway.
- Allow time to process map, complete analysis and create summary.
- Start with a small project.
- Link in with other directorate personnel who are experiencing similar problems and support each other.
- Look around for other tools to use: you don't need to keep developing new ones. This saves time and effort. The NDA site is a place to good start.
- Tap in to the NDA site and use the tools and tips if unsure how to progress or come across problems without known solutions.
- Gather and use all available evidence to underpin arguments for change.
- Know your key players and ensure that whenever possible, they become engaged in the process. If not actively engaged, then at least keep them updated with developments.
- Present evidence in terms best understood and appreciated by your audience.
- Communication, communication communication!

Additional resources

A Focus on the Whole Patient Journey
Care Outside Hospital
Flow - Reduce Unnecessary Waits
Modelling - Care Pathway Analysis Tools
Process Mapping - a Conventional Model
Reduce Things That Do Not Add Value to Patients
HepatitisBreachAnalysis.xls
HepatitisBreachAnalysis.xls
HepatitisPathwayTemplate.xls

Acknowledgements / sources

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What is it about?

Understanding the processes that make up the endoscopy pathway, both clinical and non-clinical. Redesigning these processes to reduce unnecessary waits and delays, focusing on improving patient experience, not the targets themselves.

How will it help achieve 18 weeks?

By reducing the length of time people queue unnecessarily in the system so they receive a timely diagnosis and speedier treatment if required.

What was the problem?

The unit had 2 types of target pressures - 18 week patient journey and cancer 31/62 day targets. There were long delays from GP referral to patients receiving diagnostic tests. The targets weren't the problem, but the way the processes were designed were.

What they did to identify the cause of the problem

The starting point for the team was to understand the processes and to ensure that the pathways were similar. Staff mapped the booking processes and looked at the times of steps in the process and between each stage. They studied the actual staffing capacity and the skills mix of the team to help them understand the pathways.

What they did to improve service

The team redesigned the booking system and introduced pooled lists, with agreed diagnostic slot capacity per session so the booking team could book directly into the appointment slot of the patient's choice. They removed the need for consultants to vet referrals before being booked, and created capacity in the system to deal with urgent referrals. The emphasis was placed on the best utilisation of resources available.

The unit now has six WTE endoscopy nurse practitioners who do their own lists and also backfill in for the consultants when they are on annual or study leave. The unit itself has been created with patient flow and experience as its centre.

What is it like now?

These measures have resulted in a fully booked system with all procedures booked within 6 weeks (45 days) of referral (suspect cancer 2 week wait). Overall, they have reduced non urgent waits from 174 days to 45 days.

Patients know when the test is being done so they can plan accordingly. Like booking tickets for a concert hall, they can choose to wait for a particular clinician or take the first available appointment.

The unit is achieving 95 per cent of the 31 day rule and the Did Not Attend (DNA) rate is down from 20 per cent to 4 per cent.



If a patient is seen in the outpatient department and thought to need an endoscopy, they are sent to the endoscopy unit and an appointment is made there and then. The reception team are also made aware that the patient is on the way to book an appointment, and a full information pack is provided on booking to help them prepare for the test.

Happy patients, happy doctor.

Key points

The unit needed capacity in the system to respond to urgent referrals. It also needed to make sure lists were fully utilised with planning of annual and study leave built in so nurse practitioners could backfill the lists. The team reduced some unnecessary steps in the diagnostic pathway, including the removal of the need for consultants to vet referrals prior to booking, thereby reducing delays and freeing up consultants' time.

Tips for implementation

- Ask for more office space and facilities for staff: thinking of patients' priority may mean sacrificing staff comfort.
- Enforce more clinical control over budgets.
- Encourage research.

Additional resources

Links to No Delays Essentials

- Keep the Flow: Reduce Unnecessary Waits
- Pool Similar Work Together and Share Staff Resources

Links to improvement tools and methods

- Process Mapping
- A Quick Introduction to Capacity and Demand
- Choice and Booking

Acknowledgements / sources

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Choice Appointments in Physiotherapy

07

What is it about?

Choice appointments is a system developed for patients requiring physiotherapy for musculoskeletal conditions. New referrals and patients requiring follow up appointments are given an appointment on the same day that they ring to request it. This system is now being piloted in areas such as women's health physiotherapy.

How will it help achieve 18 weeks?

Musculoskeletal conditions account for up to 30 per cent of all GP consultations and potential orthopaedic referrals. Eliminating waiting time not only helps achieve 18 weeks, but also ensures that the condition is managed effectively and does not become a chronic debilitating condition resulting in an incapacity to work.

What was the problem?

Did Not Attend (DNA) rates of 11-18 per cent, with waiting times of up to 16 weeks for routine appointments and a significant number of complaints from patients about waiting times.

What they did to identify the cause of the problem

The team considered the triggers for change; the main one being DNAs, as an unused appointment meant wasted capacity. Other triggers were the long waiting times, whilst patient feedback indicated a need for rapid treatment to improve. The team felt they needed to work differently: they began by studying demand and calculating capacity, then built in annual and study leave requirements, time for administration, in-service education and other duties.

What they did to improve service

The team minimised pre-booking. Now, when a patient is referred for physiotherapy, they are asked to telephone for an appointment on the day that they want assessment and / or treatment. More time is spent on the first outpatient appointment so a proper assessment can be made. Treatment then commences where appropriate, and clear goals are set for the patient to achieve before re-accessing further treatment. Follow up appointments are managed in the same way.

Both the teams in East Sussex NHS Trust and South Devon NHS Trust had strong front line leadership to support them through the change process to help manage the 'change pain' of moving from the current to the desired way of delivering the service.

Essential actions were identified for the change process that included:

- staff participation
- setting the direction (vision)
- specification phase
- planning implementation
- determining evaluation parameters
- agreeing the true capacity per WTE per session
- managing the staff timetable
- same day booking
- transferability to other areas / specialties.

All of the above were set within a framework for managing the change, incorporating six key elements:

- identifying the triggers for change
- moving from the current to the desired service
- agreeing the essential actions
- ensuring the skills for success
- evaluation
- capturing the learning points.

What is it like now?

The teams now know their weekly capacity for first and follow up appointments. With the investment in a good quality first appointment (with pre-booking minimised), demand for follow ups has decreased, resulting in the availability of more first appointments. Patients are happier. Here is an extract from a patient's letter on the service he received at Eastbourne (East Sussex NHS Trust):
"I was very impressed by the Eastbourne DGH physio dept. Yesterday I received a letter about their patient choice scheme inviting me to phone for an assessment appointment and at 10am I was being seen. Short of sending a physiotherapist to meet me at the ward on discharge, the service could not be bettered! Thanks for your efforts on my behalf."

Key points

- Understand demand and true capacity.
- Establish a framework for managing the change.
- Eliminate pre-booking as far as possible.

Tips for implementation

- It is essential to involve all team members (e.g. clinical, reception), at all stages of the development. The team should be co-located.
- The model has been tried and tested for three years in Eastbourne and the results verified by successful implementation in Devon. It can be adapted for the local situation but don't reinvent the wheel. We can all learn from each other's experience.
- This is a new way of working for team members. The system gives more control and choice to patients; this can be difficult for staff initially.

Additional resources

The following tools provide further detail about some of the steps used by the teams in East Sussex and South Devon in this case study:

- Managing Bottlenecks
- Obtaining Staff Perceptions
- Clinical Engagement
- Discomfort Zone
- Project Management

Acknowledgements / sources

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Fiona Jenkins, Head of Physiotherapy, South Devon Healthcare Trust and Service Improvement Lead

Sarah Marshall, Senior Physiotherapist, Torbay Hospital, South Devon Healthcare Trust and Outpatient Physiotherapy team



What is it about?

To pilot an approach for undertaking reviews of current care pathways; to assess national evidence based best practice in order to make recommendations to practice based commissioners on which pathways of care should be commissioned. The reviews also include assessment of health improvement outcomes and intervention rates.

The pilot is focusing on the cataract pathway and is supported by the suite of tools within the No Delays Achiever, particularly the Commissioning Guide to support the development of the methodology and the evaluation of national best practice.

How will it help achieve 18 weeks?

It will help organisations understand the whole current pathway across primary and secondary care, and the potential for whole system redesign, in partnership with primary and secondary care. It will also help them understand bottlenecks in pathways which make the delivery of 18 weeks challenging and address these through making a recommendation to commissioners on the best practice pathway to commission which will sustainably address delivery of 18 weeks.

It should provide clarity regarding the intervention gap between population needs and what is currently being delivered.

What was the problem?

The PCT serves a population of c.611,000 with well developed practice based commissioning within two (East and West) localities. The PCT recognised that there was a need to review and redesign pathways in partnership with practice based commissioners and providers to obtain maximum quality and value across the health economy. The Patient Journey Analyser has recently been expanded to support commissioners. However, commissioners are still reliant on their providers uploading their data and sharing the organisational passwords accordingly. The PCT also wanted to align any work associated with patient pathway reviews within the context of the world class commissioning agenda. Although the PCT has access to the national Better Care Better Value high level indicators, there is an absence of readily available specialty level benchmarking information.

What they did to identify the cause of the problem

The PCT initially focused on the engagement process with a wide range of stakeholders, whilst recognising the process was managerially driven rather than being clinically led.

However, there was confidence that clinical engagement would be obtained as part of the process of the pathway review and involvement in recommendations for any resulting service model. A primary care team was established to oversee the programme of work, whilst a primary / secondary care eyes group was developed to support engagement and to ensure transparency in relation to objectives and how they are delivered. An agreement was reached with the main provider trust to upload ophthalmology data to the No Delays Achiever site using the Patient Journey Analyser in the first instance, then sharing that uploaded data with the PCT with a manageable plan to upload all speciality data thereafter.



Ophthalmology was identified as one of the more challenged specialities for sustainable delivery of 18 weeks within the Mid Staffordshire Hospital Foundation Trust.

What they did to improve service

The planned care programme manager from within the PCT agreed with the Mid Staffordshire Hospital Foundation Trust head of clinical systems improvement and the directorate manager for ophthalmology to complete a review of the current pathway for cataract patients, including the length of time between each of the steps outlined below and which steps do not add value to the patient.

1. Referral
2. Outpatient review
3. Diagnostic intervention
4. Pre-operative assessment
5. Surgery
6. Follow up

At the same time, research was undertaken around which pathways of care were recognised nationally as good practice.

All findings were discussed within the primary and secondary care eyes group and agreement was reached to work towards condensing the patient pathway through either a one stop (pre-assessment and treat) service or a two stop (pre-assessment and treat later) model of care, and also to improving referral criteria. A number of key actions were agreed by the group.

- Planned care programme manager to meet with the consultant ophthalmologists to keep them briefed on the project and to discuss the two models with them. The two stop service would result in only small changes to the existing service model, whereas the one stop would require a more significant change. It was also agreed to discuss referral criteria with the consultants and what anticipated health outcomes they would like to see for patients as a result of surgery. This would support moving slightly away from solely activity driven contracts.
- Planned care programme manager to obtain the views of patients and members of the public on the two models of care to identify which service model is preferred.
- Practice based commissioning leads to consider the financial implications of both service models.
- Develop a 2-3 month implementation plan upon identification of the preferred model.
- No actions to be taken to improve access to the cataract service due to the levels of activity being more or less at the anticipated intervention rate, given the demographic profile of the PCT's population.

What is it like now?

The cataract pathway is quite complex across primary and secondary care, with some referral routes from GPs and from high street opticians, and can be very confusing for patients. For the majority of patients at Mid Staffordshire Hospital Foundation Trust there is a two stop service as identified above, with high levels of patient satisfaction. However, due to poorly identified referral criteria, patients can circulate around the secondary care system for a prolonged time waiting to be at the required severity of cataract, which is not consistently agreed across consultants. This can be confusing for patients who understand that they have cataracts and are anticipating surgery, but there can be perceived delays in actually having this surgery.

These proposed changes will prevent the current variation in how cataract care is delivered which results in delays, duplication and waste within the existing pathways. As a high volume surgical procedure, any improvements made towards the recommended pathway will generate savings in both time and cost. Patients should also be clearer on the pathway for cataract care.

Key points

Moving towards a world class commissioning method of reviewing pathways of care across primary and secondary care providers, linking with value for money and health improvement outcomes.

PCT commissioning approach to service redesign is slightly different to provider based approaches. Provider based service redesign is at a more micro level, identifying and eliminating steps at a very detailed level within a pathway which do not add value to the overall pathway of care, e.g. the number of times a piece of paper can move around a department without the patient having any direct benefit. However, commissioner based service redesign is more at a macro level, identifying and eliminating steps at the high level stages of the patient pathway, e.g. why do referrals need to come from a GP if a trained optician on the high street has identified that someone has a cataract? Why can't the optician list the patient directly onto a cataract pre-assessment clinic?

Data and information are used effectively to enhance decision making. Just 28% of the number of patients referred from their GP were admitted for treatment to Mid Staffordshire NHS Foundation Trust within a 12 month period. This information would help commissioners identify what happens between the referral process and the decision to admit a patient.

Tips for implementation

- Need clear outcomes of what you are trying to achieve.
- Involve key stakeholders at an early stage.
- Develop clear action and implementation action plan.
- Clearly identify a set of benchmarking comparisons to enable a view on current service delivery to be formed and to identify where there is potential for improvement.

Additional resources

Delivering Quality and Value Focus on Cataracts www.institute.nhs.uk

Acknowledgements / sources

Phil Platt
Gill Cotterill
Sharon Ross
Nicola Gray

What is it about?

Changing the culture of the work place, enabling faster access to diagnostic tests through exploring new roles and skills to improve capacity and manage demand, providing services where and when required by patients with better utilisation of staff.

How will it help achieve 18 weeks?

It ensures that the service will meet 18 weeks comfortably and gain / maintain competitive advantage in the plural NHS market by giving patients what they want and being the provider of choice.

What was the problem?

The service was in the first wave of a national pilot to modernise hearing aid services, including introducing digital hearing aids to adults and children. This stimulated increased innovation demand, with waiting times shooting up from 4 months to 2.5 years. There were severe recruitment and retention problems with staff demotivated, low morale, poor training and little CPD, working strictly to protocols - not empowered practitioners. There was a rigid demarcation of staff roles.

Patient contact time was only 50 per cent of paid day. Clerical processes were complex and inefficient. There were inappropriate clinical processes, a new to follow up appointment ratio of 1:4 and a DNA rate of around 20 per cent.

There were also financial pressures and poor relationships within the Trust, combined with a lack of co-operation e.g. IT, finance and a high resistance to change.

What they did to identify the cause of the problem

The team mapped out key relationships that needed improvement.

- PCT commissioners
- Trust management
- Trust IT department
- Trust finance department
- Voluntary bodies
- Referring sources, especially GPs/ENT

They developed a guiding principle – Get it Right First Time, and devised 10 High Impact Changes.

The team carried out process mapping, following patients right through the system to see where the bottlenecks were, and then looked at whether every step of the care pathway was essential.

What they did to improve service

- From the first time out sessions, improvements were made. Staff were empowered to improve the service, both as a team and as individuals.
- Changed from traditional service model to patient choice model to give patients what they want, not what we think they should have.



- Introduced direct referral for all patients with hearing loss, tinnitus and balance disorder.
- Improved efficiency e.g. reduce DNAs and not routinely booking follow ups.
- Invested heavily in staff training and CPD.
- Gave staff authority to act as independent practitioners guided by, but not limited by, protocol.
- Clerical staff taking over some of the clerical work audiologists were previously doing.
- Introduced the audiology assistant / associate role to perform routine clinical tasks and clerical tasks previously performed by registered practitioners.
- Collected and acted on demand and capacity data , working constantly to match capacity to demand and created flexibility in length of working day and week.
- Used tools supplied by the NHS Institute.
- Developed partnerships with the voluntary sector and volunteers.
- Continually improving service quality by acting on patient comments and complaints, using focus groups and proactively seeking patient and public involvement in service design.

The head of service also looked at the skills needed to deliver an efficient service and put having staff with a postgraduate qualification high on its agenda, meaning that these members of staff could make management decisions about individual patients, freeing up the time of more senior staff.

Implementing the patient choice service model has been a key dynamic shift in the relationship between practitioner and the patient, creating a partnership of care rather than a one way and passive relationship in which the practitioner dictates care and treatment options. This has had a high impact on reducing waste in the system. This model was developed by Andy Phillips in collaboration with the four service teams he has led within the UK and the King's Fund.

What is it like now?

Despite increasing demand, the team brought the waiting time down to zero, easily meeting the 18 week target over a period of 9 months. There was a slight blip when the Trust experienced a financial crisis and the team lost five staff. However, this did not deter them; they simply saw it as a challenge to be overcome and did so.

The clinical timetable is different each day of the year to ensure maximum capacity whilst allowing annual and sick leave. There is a variable length of initial appointment slot: each patient referral triaged by head of section; this has reduced appointment times by around 50 per cent.

Staff are trained to deliver the best possible service in minimum time by deciding themselves which tests etc. to apply with non-negotiables such as REMS but GHABP, UCL discretionary.

The working day is extended: starting earlier and finishing patient contact time later, helped by assistants who set up rooms etc. The working week was extended during waiting list initiatives with volunteer staff working evenings and weekends. 'Getting it right first time' means fewer patients need to access the service for follow up, fine tuning or review. New to follow up has been reduced from 1:4 to 1:1.

The patient choice service model means that patients better understand their condition and sometimes choose a no treatment option: these patients would have passively taken a hearing aid in the past and not worn it, just keeping it in a drawer, wasting resources and feeling dissatisfied.

As new challenges arise, the team use their improvement skills and 'can do' mindset to overcome them.

Key points

- Ask patients and the public what services they want, and provide them efficiently and effectively.
- Empower staff to improve the service and provide good, individualised patient care.
- Develop partnerships with all key stakeholders, especially patients and the voluntary sector.

Tips for implementation

Additional resources are not always required to reduce waiting times to meet 18 weeks; most services could use existing resources more effectively.

- It is economically most cost effective to provide audiology services of high quality first time as most patients present because their needs were not met initially.
- Assistant and associate practitioners are key in freeing up capacity, but these should not be used in roles where complex clinical decisions or treatments are required.
- It is important that services are aware of financial flows and ensure they get paid for all work they do.

Additional resources

Choice model of patient care

1. Evaluate written information
 - PMS
 - medical notes
 - referral letter.
2. Conversation with patient
 - expectations and attitudes
 - history.
3. Obtain test information from patient.
4. Share information with patient so that they have appropriate expectation, understand their condition to allow informed choice.
5. Present options to patient including:
 - do nothing i.e. no treatment
 - counselling
 - treatment including device
 - referral to other practitioners e.g. surgical opinion.
6. Facilitate patient choice.
7. Evaluate effectiveness of intervention for individual.
8. Continual service audit.
9. Research to develop service.

Acknowledgements / sources

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Continuous Perineural Analgesia for Fast Tracking Total Knee Arthroplasty

What is it about?

Continuous perineural analgesia (CPA), consisting of the selective catheterisation of the relevant nerve(s) and the continuation of local anaesthetic infusion into the post-operative period that enables accelerated functional recovery and reduced side effects associated with opioids with subsequent shortened hospital stay.

How will it help achieve 18 weeks?

The numbers of cases of total knee arthroplasty (TKA) are increasing significantly, therefore post-operative pain management methods that enable a patient to mobilise quickly and receive an earlier discharge help to keep down waiting times and maximise the number of people that can receive treatment.

What was the problem?

Although the length of hospital stay for TKA was quite short when compared to the UK average (5 days compared to a UK average of 9.7 days), the team felt they could do better. In addition, many of the causes of a prolonged stay were due to inadequately relieved pain or the side effects of the commonly used analgesics. The most common were nausea and vomiting, constipation and dizziness. Both pain and side effects interfered with the physiotherapists' ability to mobilise the patient.

What they did to identify the cause of the problem

A rolling audit by the acute pain team identified a length of stay of approximately five days for TKA with a fairly large variability. There were many cases of inadequate analgesia, as well as a fairly high incidence of opioid related side effects which prevented home discharge.

What they did to improve service

A study was undertaken of 40 patients undergoing TKA: 20 receiving continuous perineural analgesia, compared with 20 patients treated with conventional analgesic techniques (PCA and epidurals).

Protocols were drafted for the medical staff and ongoing teaching was assured by a consultant anaesthetist and a pain nurse.

Patients receiving continuous perineural analgesia experienced:

- a reduced length of stay in the recovery room: from 120 minutes to 60 minutes, reducing the delays in the operating room
- greatly improved analgesia with the added bonus of fewer side effects leading to accelerated post-operative functional recovery. One of the principal criteria looked at was discharge readiness, as prospectively defined by the surgeons and physiotherapists, (called virtual length of stay as this did not take into account social or chronic factors).

What is it like now?

The employment of CPA has created a culture of efficiency, motivating the whole team to look at all points of friction in the clinical pathway that might delay patient discharge, for example pre-operative assessment to optimise fitness and attention to peri-operative fluid balance in order to minimise orthostatic dizziness etc.

Patient experience has become more positive as they have less pain and more rapid mobility.

The reduction in variability of discharge readiness has made the prediction of home discharge and date of discharge easier.

Key points

- Continuous perineural analgesia is a novel analgesic technique which, when extended into the post-operative period, greatly facilitates fast-tracking of patients undergoing total knee arthroplasty.
- The real potential is that its implementation creates a culture of efficiency amongst all members of the care team, with a view to removing all points of friction in the clinical pathway.
- Patients' and nurses' satisfaction with this technique is uniformly high.

Tips for implementation

- Continuous perineural analgesia requires the involvement of the entire care team in order to maximise its full potential to provide a swift post-operative recovery. This means vigorously assessing fluid balance, digestive and urinary function.
- Getting the changing balance right between analgesia and return of motor function requires frequent (e.g. twice daily) assessment and may require either diluting the local anaesthetic with 0.9% NaCl or giving the patient a break by temporarily stopping the pump a few hours before physiotherapy. This must be done on a case by case basis.
- In the early post-operative period, be aware of the patient who underestimates residual muscle weakness and tries to get up without help from nursing staff. A sign above the bed should warn that the patient should not get up unassisted.

Additional resources

Continuous Perineural Analgesia for Total Knee Arthroplasty

Acknowledgements / sources

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What is it about?

Engaging staff to understand their role in achieving 18 weeks; applying the tools from the No Delays Achiever to understand and improve processes that contribute to delivering the patient pathway.

How will it help achieve 18 weeks?

No one organisation, individual or group will achieve 18 weeks on their own. Bradford is using this understanding to work with different staff groups to increase awareness of 18 weeks and show how each person in the organisation has a part to play.

The change in emphasis from stages of treatment to measurement of the whole patient pathway requires a greater understanding of the processes that take place along the journey. Working harder in the short term may enable a department to hit 18 weeks, but genuine redesign is the key to sustainable improvement.

A range of service improvement tools are available on the No Delays Achiever website – these have been put together to provide organisations with a library of resources to support the achievement of 18 weeks. Several of the tools were used in this work.

What was the problem?

Although staff were aware of 18 weeks, they did not fully understand their role in achieving it. When detailed work was carried out to understand processes, the potential for redesign was also identified.

What they did to identify the cause of the problem

A small group of nursing, admin staff and medical secretaries were involved in an initial process mapping session to illustrate the patient journey from GP referral to first definitive treatment. The general manager introduced this session to give the organisational context and emphasise the importance of the work that was about to start.

From this initial work, each group of staff was given the opportunity to do some more in-depth work on understanding and redesigning the parts of the patient journey that they could influence. Action teams were formed in orthopaedic registration (the admin team), the nursing team, medical secretaries and consultants.

The initial process map has been used as the core focus for all staff groups. It has been displayed in the teams' resource room, where all action teams have held their meetings. Each group built on this process map to identify potential areas of delay and used other tools from the No Delays Achiever to explore these issues further. Tools such as Dot Voting proved particularly useful, and showed the registration team that they were in control of the improvement work. Fresh Eyes enabled people to take a different perspective on the issues they were dealing with and helped them think differently and more creatively. Further mini process mapping sessions were held to identify the detail behind the overall patient journey. This detailed mapping illustrated the complex interrelationship of processes and enabled staff to see the need for consistent working practices.

What they did to improve service

During the initial process mapping exercise, it became clear that levels of understanding about 18 weeks and the complexity of the patient journey were variable. As a result, a plan was devised to involve the rest of the nursing, registration and medical staff, as well as the medical secretaries and general managers.

As a result, the team:

- decided that 18 week awareness is a trust wide issue
- used trauma and orthopaedics as a pilot
- have designed and are testing an awareness programme, including accurate completion of the clinic outcome form.

The team worked with each staff group to ensure that the awareness sessions met their needs.

Each staff group's sessions covered the following issues:

- awareness of 18 weeks
- understanding their role in achieving 18 weeks
- understanding what matters and what can make a difference
- understanding the patient journey.

What is it like now?

The whole trauma and orthopaedics team has an increased understanding of the principles of the 18 week rules, particularly around clock starts and stops, and the definitions for this specialty. Staff also have a greater understanding of how everyone contributes to the patient journey and how their roles complement one another.

By engaging a wide range of staff, previously unidentified bottlenecks and other delays were identified and redesigned. The key to removing these delays was through working directly with the group of staff responsible for each part of the patient journey and applying tools from the No Delays Achiever.

There are a range of new ways of working for the trauma and orthopaedic registration team. Several areas were identified where processes could be redesigned or the way of working could be changed to reduce unnecessary delays. For example, individuals in the team used to be responsible for named consultant clinics; in effect having a work caseload, which made covering each others' work challenging if staff were absent. Now, they have formed two teams – the trauma team and the orthopaedic team, and all work is pooled. They have used simple approaches such as a highly visible box for all referrals to be put into to help others understand and work in their new ways. The registration team took ownership of changing the current working practices, by designing the new team arrangements themselves for example. This engagement enabled rapid testing and implementation of change. As a result, morale has improved: during testing the team had a period of significant sickness and were able to cover the workload much more effectively than with their previous way of working.

Medical secretaries are working towards consistent working practices that remove delay from the system and enable more cross-cover between them. A working practices manual is being put together, which will be used by existing staff and which will be particularly useful for inducting new medical secretaries. This group of staff is now more aware of 18 weeks overall, and their role in achieving it.

In addition to now having a raised awareness of 18 weeks, the nursing team have undertaken several pieces of process improvement and redesign work, including a test to triage 'dear team' referrals to reduce delay, working with consultants to develop referral protocols for GPs. They have contributed to the development of guidance notes to ensure accurate completion of clinic outcome forms. By working with the people who actually do the different elements of the job, the team had access to people who were experts in what they do. Their contributions are an essential element of informing the service improvement.

Through weekly 30 minute meetings with each group of staff during the implementation phase, any problems and unintended consequences were discussed and worked around.

The Trust is a No Delays ambassador site, which meant that the team had the support of an on-site facilitator two days a week. The facilitator worked with the team to identify and apply the tools from the No Delays Achiever; the use of the tools has been pivotal to the success of this work.

Key points

1. Genuine engagement – senior leaders gave their support to this work, but operational staff were empowered to take control of the redesign.
2. Ensure a consistent message is delivered in a tailored way to meet the audience's needs.
3. Allow time for discussion to ensure understanding and accurate completion of clinic outcome forms.

Tips for implementation

- Allow time for genuine engagement – it does take time and effort, but pays off as staff gain a real understanding.
- Feeding people is a good idea if you need people to work through their lunch time.
- Get key cross-team influencers (e.g. matron) on board early.

Additional resources

The following tools provide further details about some of the steps described in this case study.

- Demand and Capacity - Basic Concepts
- Flow - Reduce Unnecessary Waits
- Human Dimensions - Empowerment

Acknowledgements / sources

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What is it about?

Patients recover more quickly if they receive all aspects of care in the Enhanced Recovery Programme. This is a structured, evidence based approach designed to prepare patients for surgery and reduce its physical impact, helping patients to recover more quickly. A multi-modal approach, the Enhanced Recovery Programme helps to reduce hospital mortality and morbidity. It subsequently enables early discharge with reduced costs, and early resumption of normal activities.

How will it help achieve 18 weeks?

Implementing a reliable system that can be consistently applied and measured for compliance also helps to reduce length of stay (LoS), releasing resources to improve throughput. In addition, reliable systems reduce variation.

What was the problem?

On hearing of a multi-modal (care bundles) approach to peri-operative care for colorectal surgery at The Royal College of Surgeons, the team at Torbay felt it would be unethical not to change their practice. There were many publications on various elements of peri-operative care: the use of opiates, catheters, nutrition etc. that could improve patient recovery, but Dr Kehlet (Copenhagen) was the first clinician to combine and implement the suggested improvements of all the elements. Through this approach, Dr Kehlet was able to dramatically improve patient recovery and reduce length of stay to three days after surgery when the norm was 10-14 days.

What they did to identify the cause of the problem

The first step was to establish a project team who examined the existing colorectal integrated care pathway and amended the following elements where necessary:

- pre-operative
- surgical technique
- pain relief
- fluids
- nutrition
- structured activity
- post-operative care
- discharge.

Clear definitions and guidelines were agreed for each of the above to ensure that appropriate processes and treatments were adopted each and every time.

What they did to improve service

The initial project team was kept small, consisting of a consultant surgeon, a consultant anaesthetist (the consultants in each of these groups elected their representative), the matron, a dietician, a person from the pain management team and a nurse consultant from gastroenterology. Other key stakeholders were pulled in at specific points as required.

Central to the plan was demonstrating the evidence base to clinicians, so the literature was made widely available in the clinical areas. Once everything was signed off, written and ready to go, training commenced. It was education, education, education. A core number of people were trained to pass on the training. This ensured that the new system was designed in a way that could be replicated each and every time.

A colorectal integrated care pathway had already been developed; this helped the Enhanced Recovery Programme implementation because consultants were used to working in a care pathway approach. As part of the project plan, the team tried to make it difficult for staff NOT to follow the new care pathway, e.g. the only paperwork available was the Integrated Care Pathway paperwork, whilst drug prescription charts were already written for required drugs.

Another way of driving the pathway was giving patients their own care pathway documentation. This informed patients of what should happen from pre-assessment onwards, and also meant that they were given the paperwork on admission. The patient and their carers recorded what the patient ate or drank, as well as the distance walked and when catheters and epidurals were removed.

The enhanced recovery nurse drove the programme, checking that the pathway and pain management procedures were being followed. The nurse and ward sisters had extended skills enabling them to dispense epidural top ups so they weren't reliant on other teams to do it. The nurse also collected data and collated evidence of improved morbidity and success.

Key steps in the programme were pre-op assessment (planning ahead), change to surgical technique (designing a reliable system) and preparation of patients on the ward (patient involvement in the pathway).

What is it like now?

68 patients went through the programme from September 2005 to May 2006 and a further 116 from September 2005 to August 2006. Data collection shows:

- 50 per cent of patients had transverse incisions
- 70 per cent of patients started eating on day one
- 50-60 per cent of patients opened their bowels on day one
- The mean length of stay = 8.9 days.

There are now clear definitions in the pathway. For example, before the programme, the notes would state 'mobilised patient'. However, there were different interpretations as to what distance was sufficient. The yellow lines used now are exactly 60 metres long. This gives a systematic measurement of patient mobilisation. The ward nurses assist patient mobilisation and so there is less need for physiotherapy input.

The mindset of both staff and patients is important: informing patients that they will feel as well on day five post-op as they would previously have felt on day 10 because of the new enhanced care regime. A pre-op booklet educates and informs patients about what things to seek advice for post-operatively. The ward team know that they are expected to take calls from discharged patients, even if out of hours. Patient expectations match the pathway – words used are all deliberate, e.g. including things like The Incredibles' super hero logo 'Dash', representing a faster recovery. The integrated care pathway record is kept at the foot of the patient's bed; easily accessible for them and their carers to read. Shift handover happens at bedside so the patient is involved and the process is open. Thus the patient's role is to support and reinforce compliance to the pathway.

Key points

- Clear definitions underpin each of the areas of the pathway, creating a consistent and reliable approach which every member of the team (including the patient) understands.
- Patients have a major role to play in supporting and reinforcing the pathway.
- Having a clear and reliable system for each step of the pathway enables the team to plan ahead and get ready for the next step.

Tips for implementation

- The first team meeting should agree a way forward. Clinical leadership is necessary to gain buy in / ownership and see whole parts of the system.
- Robust, comprehensive project planning with realistic timescales makes a difference.
- Nurses should record evidence of what they are doing: live and regular feedback.
- Make sure the multi-modal approach happens through tenacious management of the pathway.
- If doing again, use a PPI event or focus group before implementing and share the pathway / paperwork etc.
- Be prepared to make tweaks along the way - continual learning / improvement is important.

Additional resources

The following tools provide further detail about some of the steps used in this case study.

- Enhanced Recovery Pathway
- Length of Stay
- Protocol Based Care
- Reliable Design
- Pre-operative Assessment
- Variation
- Focus on the Whole Patient Journey
- Stakeholder Analysis
- Clinical Engagement
- Obtaining Staff Perceptions
- Getting Patients' Perspectives
- Writing Clear Patient Information

Acknowledgements / sources

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What is it about?

Applying Lean principles to improve the flow of patients and information throughout the hospital and patient pathways; ensuring timely clinical decision making regarding treatment and discharge.

How will it help achieve 18 weeks?

This case study illustrates how to reduce things that do not add value to patients, keeping the flow to reduce unnecessary waits and keeping things moving. This example shows that, by removing a small but unnecessary process step, 40 minutes a day were saved. That is almost 10 per cent of someone's working day, freeing 10 per cent of staff time to impact on 18 weeks.

What was the problem?

In the pathology department at Hereford Hospitals NHS Trust, test results were being delayed, impacting on patient discharge.

Staff experienced delays for test results for GPs, inpatients and outpatients. The layout of the department was not based on the sequence of the flow of the work and demand varied significantly by hour, with a disproportionate amount of GP specimens arriving late in the afternoon. Specimen reception was unmanned and specimens typically waited 30 minutes before they were processed. In addition, courier routes were not planned to stagger the arrival of specimens which were put into buckets, making it hard to see which specimens had arrived first.

Staff found it difficult to enter all the patient information and test request details onto the computers. This was not synchronised and specimens had to wait before being analysed.

Phlebotomists brought inpatient specimens in a large batch, usually of about 50, at 11am. There was a lot of duplication of activities and much wasted movement e.g. time spent searching for equipment and staff.

What they did to identify the cause of the problem

The problem was identified through a report by the Audit Commission in which staff themselves highlighted the delays occurring in pathology between the test being taken and the results being known.

More than 40 staff in pathology participated in a one hour training session in which staff themselves helped to identify what was important and needed improving in the flow of work and eliminating waste.

Pathology processes were observed to understand how the work was done - from request made, to results available. The approach was to walk the entire process, identifying each process step and the problems associated with those steps. This approach required staff from pathology and the transport provider from the PCT to work through the procedures together.

What they did to improve service

- Manned specimen reception.
- Labelling, centrifuges and booking relocated in specimen reception and synchronised.
- Standard work introduced for labelling, centrifuging and booking in.
- First in first out (FIFO) system introduced.
- Phlebotomist now sends work via POD system.
- PCT GP demand staggered (batches reduced).
- Visual management used to optimise specimen reception.

What is it like now?

- Improved flow: delays have been almost eliminated in specimen reception. Urgent work, including A & E and ITU is processed immediately rather than being left in specimen reception.
- Duplicate steps have been removed at labelling (double handling). Centrifuge optimised to improve flow at busy times.
- Re-work has been reduced at the scanning stage. Fewer staff are now required at labelling and booking in. The working area is quieter with less interruptions. The staff is more productive with minimal movement. Turnaround times are faster and extra space has been created in lab 1.
- Work is done in a standard way. Work flow is more predictable, problems are immediately visible.
- All specimens are processed in the same way. This has improved turnaround times and reduced variation.
- Specimens arrive in the lab up to three hours earlier, improving the flow of work. Batches of 50 specimens have been reduced to 2/3 specimens. There is no longer a rush at 11am and bloods are not walked unnecessarily around the hospital.
- Improved flow allows the department to manage work more effectively. Results are now available earlier for GPs with fewer delays for inpatient work. Fewer haemolysed bloods (due to excess travelling time in van), which improves the care and quality of the service.
- Porters are sorting their own specimens and not disturbing pathology staff.
- Staff are putting things in the right place and specimens are not going missing.
- Cleaner work areas with less clutter.

Key points

The application of Lean principles allowed improvements to be made in nine days (over a six week period), with no extra resources. Staff now feel empowered to make improvements themselves, and just get on making the work flow. Productivity gains are measurable and significant, whilst improving quality has been raised by 2.5.

Tips for implementation

- Involve the senior leadership, both clinical and managerial, as this demonstrates to staff that managers are serious about the changes.
- Time planning in advance, moving everyone to same point – knowledge of Lean.
- Take photos before and after to demonstrate differences.
- Measure before and after to demonstrate differences.
- Need someone dedicated to engage staff and accelerate/facilitate improvement.
- Changes happen in the workplace not removed from area of work - walk the process.
- Learn by doing – Plan Do Study Act.
- Communicate any changes to people who are going to be affected.

Additional resources

The economic benefits of this case study are illustrated in Hereford Pathology: Finance Version. The following tools provide further detail about some of the steps used by the pathology team in this case study.

- Keep Things Moving: See and Treat Patients in Order
- Reduce Things that do not Add Value to Patients
- Lean – a Quick Overview
- Variation
- PDSA Cycles
- Obtaining Staff Perceptions
- For the process walk through see Alternative Ways to Conventional Process Mapping

Acknowledgements / sources

Neil Westwood and the Pathology Department at Hereford Hospitals NHS Trust





What is it about?

This case study details the financial benefits that resulted from a classic demand and capacity study in Hull and East Yorkshire. The project team assessed demand, capacity and activity for echocardiography as a way of reducing the backlog of patients and waiting times. This case study also includes a tool to calculate the economic value of the benefits to the NHS and patients.

How will it help achieve 18 weeks?

Demand for echocardiography as a diagnostic tool is thought to be on the increase. Understanding demand and capacity and responding accordingly helps to ensure flow through the service. It enables the service to predict and cope with increasing demand. The focus is on reducing unnecessary waits, planning ahead and keeping things moving.

What was the problem?

There was a bottleneck in trans-thoracic echocardiography which was restricting patient access to appropriate care. The inpatient wait was 10 days, with the outpatient wait reaching 145 days. It was initially thought that the long waiting times for both in and outpatients was due to a shortfall in capacity and plans were developed to buy more machines. However, through focusing on the whole patient journey, it was found that in fact there was sufficient capacity, but it was under utilised.

What they did to identify the cause of the problem

- The team began a three month improvement study.
- Analysis of referral patterns showed clear patterns.
- They carried out a baseline analysis which showed that capacity for echocardiography was 280 slots / month (80 per cent capacity = 224 slots / month), whilst the demand was 209 slots / month (108 inpatients and 101 outpatients). However, activity was only 184 slots / month. Waiting times were 145 days for outpatients and ten days for inpatients with up to 40 per cent of inpatients discharged without having a scan.

What they did to improve service

The process for booking patients into designated slots to match patient demand and activity was changed; they minimised the non-imaging duties of technicians and portering services were used differently.

- The team stopped booking outpatient slots every day of the week.
- On Tuesdays there were no planned slots in order to meet inpatient demand from Monday's consultant ward rounds.
- Porters and wards were given a list of patients required for echocardiograms on Tuesdays and the time of their slot. This was important because the hospital is on 13 floors and they needed to ensure that patients arrived on time.

What is it like now?

- The team now has two afternoons for inpatient slots towards the end of the week.
- Without the need for additional resources (i.e. capacity remained the same), there is increased activity to 247 slots / month from 184, and waiting times are reduced to less than 2 days for inpatients and less than 75 days for outpatients.

There have been significant benefits for the NHS and for patients.

NHS benefits

- Efficiency as measured by activity increased by 25 per cent.
- Activity up from 184 to 247 slots per month with no extra resources.
- Unit cost reduction of 25 per cent.
- Equipment : echocardiography machine productivity up by 25 per cent.
- Reduced lengths of stay for inpatients.

Benefits for patients

(i) Waiting benefits for patients

Outpatients:

- Reduced waiting times for outpatients from 145 days to less than 75 days
- Outpatient waiting down by 48 per cent.

Inpatients:

- Reduced waiting times for inpatients from 10 days to virtually zero (under 2 days)
- Inpatient waiting down by at least 80 per cent.

(ii) Health benefits for patients

- Benefits from better flows
 - before - because of long waits up to 40 per cent of inpatients discharged without an echocardiograph
 - after - all inpatients receive an echocardiograph
- Better patient experience
 - reduced length of stay
 - discharged patients don't need to queue for outpatient appointments.

Calculating the economic value of the benefits of the project

Economic benefits to the NHS

(i) Reduced length of stay for inpatients has an economic benefit for the NHS of over £0.8m.

Methodology

The minimum cost per day of inpatient stay is £339 (from minimum cost HRG for elective inpatient from 2006-07 tariff).

Here the inpatient waiting is estimated to reduce the patient journey by two days. So the total annual economic cost is £813,600 (i.e. $339 \times 2 \times 100 \times 12$ for throughput of 100 inpatients per month).

(ii) Activity up from 184 to 247 slots per month with no extra resources means unit cost reduction of 25 per cent and this is equivalent to increased income of £114,000.

Methodology

The HRG cost of outpatient cardiology appointment 2006-07 is £151 and there is an increase in activity of 63 slots per month, so the income equivalent to increased activity is £114,156 (i.e. $63 \times 12 \times 151$).

Economic benefits to patients

(i) Reduced waiting for outpatients implies a total economic benefit for patients of over £90,000.

Methodology

The cost of waiting for a patient is around £100 a month on average. This is probably lower for outpatients, estimated at £22 a month (which compares with a Canadian study's conclusions on cost of waiting for a cataract operation at £22 to £91 per month).

Outpatient wait reduced from 145 to 75 days which equates to 70 days or 2.3 months. This implies that the total annual economic cost (for outpatient throughput of 150 slots per month) is £91,080 (i.e. $22 \times 2.3 \times 150 \times 12$).

(ii) Reduced lengths of stay for inpatients implies a total economic benefit for patients of over £30,000.

Methodology

The cost of waiting for patients is around £100 a month on average. Here inpatient waiting times are reduced by eight days, from ten to less than two days. However, the cardiology consultant estimates that the patient journey will in fact reduce by only around 2 days i.e. 0.0657 months. So the total annual economic cost for patients is £7884 (i.e. $100 \times 0.0657 \times 100 \times 12$ for throughput of 100 inpatients per month).

Key points

Assumptions were made about the problem being under capacity. It was only when the team analysed the problem through process mapping that they found that there was sufficient capacity, but it was under utilised. An economic analysis tool gives a strong case for this approach.

Tips for implementation

See Matching Demand and Capacity in Cardiology.

Additional resources

For the full description of this case study, see Matching Demand and Capacity in Cardiology.

The following tools provide further detail about some of the steps that have been described:

- A Comprehensive Guide to Capacity and Demand Analysis
- Keep the Flow: Reduce Unnecessary Waits
- Managing the Bottleneck
- Role Redesign

Acknowledgements / sources

John Caplin, Hull and East Yorkshire Hospital Trust



Improving Transfer Processes at the End of Heart Surgery

What is it about?

Prof Elliott, Head of Cardiac Surgery at Great Ormond Street Hospital for Children, and his colleague Dr Allan Goldman, in charge of paediatric cardiac intensive care, became aware of the similarities between the handover disciplines from theatre to intensive care and what they saw in the pit of a Formula 1 racing team.

How will it help achieve 18 weeks?

Understanding the importance of clarity and consistency during any handover process in the patient pathway, making sure they are smooth and efficient can help to reduce delays.

If everyone involved in a handover is clear about their role, it helps reduce errors and improve patient safety and outcomes.

What was the problem?

A collaboration took place between the leaders of Great Ormond Street's surgical and intensive care units, first with the McLaren F1 racing team and then with Ferrari's team.

The single A4 sheet of paper which contained the flow diagram of Ferrari's pit procedure, multiplied in size when Mr Stepney and his colleagues at Ferrari were confronted with the critical transfer from operating theatre to recovery room at Great Ormond Street.

"They were quite shocked at the complexity of what we did and the kind of kit we had at our disposal," said Prof Elliott.

"They saw us operating on a solid table with the child under a heating or cooling blanket and all the vital connections to the various bits of equipment, and then having to unplug everything and use a hand-operated ventilator as we took the patient out of the theatre, into the lift and along the corridor to intensive care. Their first thought was why didn't we do everything on a bed trolley that was equipped with everything we needed and didn't require disconnecting and reconnecting? I pointed out that the manufacturer did not exist who would invest that sort of money in such a specialised product. That's when they started investigating human solutions and training methods to solve our problems."

What they did to identify the cause of the problem

The leaders of Great Ormond Street's surgical and intensive care units collaborated first with the McLaren F1 racing team and then with Ferrari's Team Chief Jan Todt, technical guru Ross Brawn and, in particular, Race Technical Director Nigel Stepney. They worked together at their home base in Modena Italy, in the pits of the British Grand Prix and in the Great Ormond Street theatre and intensive care ward.

The surgical team watched videos of themselves at work which highlighted the lack of structure that they had previously been oblivious to.

What they did to improve service

A major restructuring of the patient handover procedure was implemented, resulting directly from the input of the F1 pit technicians. This process will soon be described in two scientific publications.

"It is not too early to say that, when we look at the number of critical instances we encounter, they have reduced markedly since we introduced the modified training protocol developed from what we have learned from Formula 1," says Prof Elliott.

What is it like now?



As 18 month old Alexander Barham was wheeled into intensive care, his survival depended on the expertise of the medical specialists all around him and, in no small part, on the split second precision of the Ferrari Formula 1 motor racing team. Prof Martin Elliott had just performed a three hour hole-in-the-heart operation and watched in silence as three members of his surgical team began the practised routine of coupling a bewildering of tubes to drug supply, ventilation and monitoring equipment above the young patient's head.

"This is perhaps the most critical stage of the operation and a year or two ago it would have been full of noise and movement as everyone, including me, got into the action, often getting in each other's way," he whispered. *"But that was before our research work with Ferrari transformed the way we work."*

"You'll notice that not a word is being spoken while he's being connected up. The nurse and doctor who'll be with him throughout the night are taking notes from the information being displayed ... now our consultant anaesthetist is with Dr Anne Karimova, the Head Intensivist ... all the portable equipment is now being removed ... there go the bleeps as all the alarms come on line ... another sister moves in to check the drains and urine outlet ... still not a word."

At last comes the moment when Prof Elliott can stride forward to lay enquiring fingers on his tiny patient.

"We had all been doing our jobs for years and we thought we were pretty good at it," said Dr Nick Pigott, the consultant in paediatric cardiac intensive care, who has worked alongside Prof Elliott and Dr Goldman throughout Operation Pit Stop.

"Then, after we had been with the Ferrari team, we watched videos of ourselves at work and it was quite a shock to realise the lack of structure in what we were doing. Under Prof Elliott's predecessor, we had been working for some time with the aviation industry. But there is no doubt that it is our research with Ferrari that has honed our transfer from theatre to intensive care to the level of silent precision it is at today."

With a greater success rate?

"Numbers are too small to claim a reduction in mortality, but there is no doubt that we now have a reduction in morbidity - that is to say, illnesses that the patient did not come in with," said Dr Pigott.

Key points

- Standardised handover, eliminating variation.
- Clear and concise instructions are required to ensure that even if team personnel changes, all members are absolutely clear about their responsibilities.
- Teamwork is essential.

Tips for implementation

When looking for a solution to a problem, using Fresh Eyes or Thinking Creatively may often help to locate a solution which is outside the normal routes of problem resolution.

Communication of changes and new ways of working to all staff involved and affected is a critical factor in success.

Additional resources

Handovers-Situation-Background-Assessment-Recommendation (SBAR) is a simple framework which enables staff to share clear and consistent information about a patient's condition.

Journal:

Catchpole K, de Leval M, McEwan A, Pigott N, Elliott M, McQuillan A, MacDonald C, Goldman A (2007) Patient Handover from Surgery to Intensive Care: Using Formula 1 and Aviation Models to Improve Safety and Quality. *Pediatric Anesthesia* 17(5), pp. 470-478

Website:

The Nuffield Department of Surgery, University of Oxford

Acknowledgements / sources

The picture and extract above is taken directly from an article in the Telegraph which describes in detail how the process works now:

'Ferrari pit stop saves Alexander's life' by William Greaves - the Telegraph, 29th August 2006



What is it about?

Running green stream theatre lists can dramatically increase productivity through economies of repetition and scheduling and improving patient care, whilst also improving working lives.

How will it help achieve 18 weeks?

Focusing on improving the flow for the high volume regular procedures reduces delays in the overall patient journey. Reducing the number of touches / reordering of facilities in the hospital ensures that the patient moves in a timely fashion through the unit, enabling more patients to be seen within current capacity.

What was the problem?

Not initially identified as being a problem as the hospital is a high performing hospital. However, the team felt they could do more to improve. Through the desire to do better they found problems in the day case unit:

- 34 patient touches
- poor flow of both patient and staff journey through the day case unit
- mixed sex change and treatment areas
- mix of local and general anaesthesia cases
- information lacking.

What they did to identify the cause of the problem

Carol Makin, Consultant Surgeon became interested in the Lean approach and how it could apply to healthcare after reading Lean Thinking by Dan Jones. Carol persuaded the executive and surgical teams to hold a week long workshop for the people who worked in the surgery system learning and applying Lean principles.

The week took place in May 2006. It was agreed to start at the beginning of a new financial year, so that by April 2007, the team would have a full financial year's improvement data to demonstrate both improvement for patients and staff, but also potential impact on the bottom line.

Carol spoke with people personally and invited them to join in on the work. People taking part in the week included anaesthetists, orthopods, urologists, general surgeons, directorate managers for surgery, urology and orthopaedics, radiographer manager, associate director for surgery, practice development facilitator, theatre receptionist (also union rep), orthopaedic theatre co-ordinator, orthopaedic associate director, advance nurse practitioners, acting day case ward manager, pre-op assessment and some people external to the unit: a consultant surgeon, pathologists, obstetrics and gynae, SHA service improvement lead and two managers from Burton on Trent Hospital.

The week took place in a recently vacated neuro rehab unit and commenced on the Monday morning with Ian Glenday, a Lean facilitator, giving everyone an introduction to Lean principles and people getting to know each other, and the afternoon walking the patient journey. In the evening the team dined together to further build working relationships for the week ahead.

Lean day two the team divided into four groups – everyone self selected the group they wanted to take part in. These groups reflected four identified pressure areas.

1. Data – identifying the green stream
2. Outpatients and pre-operative assessment
3. Day case unit
4. Staff niggles (the most powerful group)

Data to support the work of group one was vital - and as the Wirral Hospital is one of the most computerised hospitals in the NHS, not a problem. This was pivotal in the team being able to successfully apply the Glenday Sieve, a type of Pareto tool, in helping to apply the 80/20 principle to areas of focus for improvement efforts. The green stream group didn't believe the figures.

The team found that:

- typically 6% of procedures equal 50% of workload
- at Clatterbridge, 4.2% of procedures account for 52% of theatre throughput (see below).

The Clatterbridge green stream

- LA flexible cystoscopy 15%
- GA cystoscopy 11%
- Hernias and varicose veins 7%
- Hip / knee replacements plus knee arthroscopy 9%
- Excision of lumps and bumps 4%
- Lower GI endoscopy 3%
- Carpal tunnel 3%
- Total 52%

Groups two and three used value stream mapping to help identify the number of patient touches in the pathway and put dots where a patient's flow stopped: reception, clinic check in, tests. The outpatient map was a messy spaghetti picture.

The groups also walked the walk through the departments - a real eye opener. They then brainstormed how to make things better. Changes started on day two.

What they did to improve service

They smoothed outpatient flow, reducing patient touches from 26 to 13. Outpatient scheduling was reviewed. Pre-operative assessment was started at the time of outpatient appointment with ECG and phlebotomy carried out as part of the assessment. The plan was to free up time, with one nurse taking the patient through the outpatient experience. It is anticipated that 200 ECGs will be done per month at pre-op assessment in O/P, freeing up capacity in the cardiology department and pre-op chest x-ray in outpatient department radiology.

Microscopic haematuria referrals are linked to LA flexible cytoscopy slots and ultrasound scans. Robust booking procedures at the time of decision to operate were established, and paperwork reduced.

All the above combined to make the outpatient appointment and pre-operative assessment a one day process.

Day case unit

Patient flow wasn't working well through the department with GA and LA patients mixed together, so separate streams / areas for GA and LA patients were created. This was all done on Thursday of the workshop week. The team used paper and pens to redo signs as a temporary measure so as not to let that be a barrier to delay the changes. The system went live on the Friday morning.

Non-added value steps for patients were removed, reducing patient touches for general anaesthesia from 34 to 11 (-66%), and for local anaesthesia from 34 to 8 (-75%).

The team commenced staggered ward rounds for general anaesthesia (one anaesthetist and one surgeon).

A cystoscopy pathway was established as part of urology.

The team also looked at the problems with mixed sex patient areas and privacy and dignity issues. They created single sex areas on both GA and LA units based on current activity of 70:30 gender ratio.

Expected time of discharge was introduced to reduce delays for both patients and relatives.

Unnecessary duplication for staff was reduced.

Staff niggles addressed

Total niggles identified -168

Practical issues identified as fixable - 59 (35%)

- 45 (74%) were fixed
- 14 (26%) were actioned
- Niggles given to flow stream 64 (38%)
- Long term niggles 45 (27%)
- Room sizes - estates issues
- Staff attitudes - training etc.

Estates weren't forewarned, but did address issues and now have established one day a month where they do quick fixes.

Green stream lists introduced

Green lists were introduced for:

- flexible sigmoidoscopy - no sedation
- LA lumps and bumps
- colonoscopy - sedation
- primary knee replacements - GA
- LA flexible cystoscopy.

The rules supporting green lists were individually agreed and embedded. In a true green operating list the only weekly variation should be the patient's name, and where appropriate, laterality. The aim is to achieve transparency and rigidity for routine work, in order to obtain flexibility for extraordinary events. All lists are displayed on the theatre notice board and visible at the start of the day. Everyone knows what to expect on green list sessions: anaesthetists, ward staff and porters know what operating kit is needed so there are no sudden surprises.

Other lists (such as Carol's alternative Monday lists) aren't so predictable – these are red lists, or as Carol calls them, green dot lists because the most straightforward patient can be first on the list, so the list can get going while other cases are sorted out – reducing total delay.

The booking process was centralised as lists go green, supporting the Primary Care Information System (PCIS) replacement plans for centralised admission / discharge / transfer functions.

Green lists are about the 'economies of repetition'.

Green stream rules – have to stick to the rules

- Patients will not be cancelled from green lists
- Theatre will start on time
- (Start time = knife to skin)
- Breaks and lunch will be scheduled to minimise disruption
- There will be no change to theatre list order on the day of surgery
- Anaesthetic department to co-ordinate anaesthetists' and surgeons' sessions
- Patients will be scheduled when they fulfil pre-assessment criteria
- Clerks book green stream lists according to standard templates
- Mixed lists begin with green cases
- Pooling should occur
- Admit patients on day of surgery
- Medical staff to book leave 6 weeks in advance

Theatre coordinators meet daily at 8.30am. They review the previous day's lists, discuss any problems that arose and how they were solved. Did all green lists start on time and if not why? Numbers of issues are logged on a chart. If any problems have arisen, the surgical teams write them on the theatre lists so that the co-ordinators know. They also scan that day's lists and anticipate any potential problems and discuss prevention.

Allows expert know-how to be shared by all staff.

What is it like now?

The unit has improved performance and efficiencies due to economies of repetition. Bottlenecks are identified and eliminated. Capability and capacity opportunities are highlighted.

There is less fire fighting, confusion and uncertainty.

There is increased capacity for GA and LA cases: ten extra GA cases per week on average post rapid improvement workshop. An extra 1.5 knee replacements are done per week.

Communication between booking and theatre teams has improved and there are predictable scheduling and theatre lists.

Morale is improved and the team is doing more with less.

Momentum is maintained by sticking to the green stream rules and holding bi weekly meetings with key staff to:

- review the status of open action items from project plan
- review process metrics to ensure improvements are being achieved
- discuss additional opportunities for improvement
- continue to improve the process.

What next?

The team will continue to identify green lists and introduce green 'spot' lists; these lists will always start with the same procedure. They will also start identifying red lists where the case mix is unpredictable. Very importantly, they will continue to communicate with all involved parties.

Key points

Applying Lean principles in healthcare works by:

- improving performance and efficiencies due to economies of repetition
- highlighting capability and capacity opportunities
- creating more predictability, ability to plan, reducing confusion and most importantly maximising flow for the patient.

Additional resources

Glenday Sieve - Runners, Repeaters and Strangers

Acknowledgements / sources

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What is it about?

Applying Lean methodology to the therapy services administration and clerical functions at Bolton Hospitals to help plan and implement a central administration and clerical team responsive to the changing needs of the collective therapy department.

How will it help achieve 18 weeks?

The admin and clerical team is responsible for clinic referral and waiting list management and dealing with clinical correspondence for the podiatry and dietetics service. Greater efficiency / timeliness in these processes will ensure no unnecessary delay.

What was the problem?

Traditionally, therapy services had been managed in five separate departments: dietetics, occupational therapy, orthotics, physiotherapy and podiatry. The services have been subject to a restructuring exercise – to be managed as a collective service. This meant that five separate admin and clerical functions needed to come together as one cohesive team. In addition, the team needed to contribute to the Trust cost reduction plan. At the same time, one of the clerical team was about to retire and they saw applying Lean as an opportunity to do the same work with one less post.

What they did to identify the cause of the problem

A multi-disciplinary team was formed, comprised of front line staff, managers and the Lean team, in addition to staff from other departments to provide ‘fresh eyes’.

A value stream analysis event was held to look at current processes and duties carried out by the admin and clerical staff within the different departments to distinguish value from non-adding value steps, to identify waste and inform areas for future improvement. Initial findings were that processes had lots of waste, inefficiency, duplication and inventory (e.g. patients on a waiting list). A summary was made of the main duties and responsibilities of the admin and clerical team.

What they did to improve service

The team developed a value statement and an implementation plan for a central admin and clerical cell (cell = specialised grouping, in this case of people). This included holding a rapid improvement week when all the changes were made.

Value statement

“The administration and clerical team will deliver an efficient and co-ordinated service to staff, patients and others, working enthusiastically as a valued integral part of a high quality therapy department.”

Future state (the changes)

- Team based in one office (moved five to achieve)
- 6s office and implement visual management
- Shared skills, duties and cover
- Establish standard work for current duties
- Relocate dietetic clinic

- New referral process to dietetics
- Create combined store and stock control for stationery, printing and stock items
- Remain flexible to support changing needs of the therapy department

What is it like now?

There is a specific admin and clerical Lean cell (specialist function) in which effective team working and standards are evident. The success criteria to date include:

- 20 per cent reduction in steps in the combined processes
- 15 per cent decrease in combined touch time
- efficiency of the team improved by taking out wasteful steps in the processes and reducing the touch time required for the value added steps. This then meant that the team did not need to recruit to 0.8 wte vacancy and they made a further cost saving
- reduced costs for stationery and other stock by ten per cent.

The merging teams were in control of the changes from start to finish, understanding the processes before they came together. Empowered to implement the move and improvements themselves and seeing how they added value to patient care, ensured that there was no resistance to the change.

Key points

- Enable and empower merging teams to work together to understand the current processes, identify non-added value steps and redesign future processes so start as mean to go on.
- Empowered teams feel valued, in control and happier in their work.
- Enable admin and clerical teams to see their role in providing timely patient care.

Tips for implementation

- Sometimes what appears to be a negative objective can become a positive and ways to meet and exceed it found through applying Lean.

Additional resources

An Introduction to Lean

Further NHS Institute for Innovation and Improvement resources about Lean

Acknowledgements / sources

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What is it about?

Enabling a PCT to use the Patient Journey Analyser tool to allow it to analyse and review its community specific pathways (or part pathways) through analysing its own data.

How will it help achieve 18 weeks?

By understanding challenges in the community pathways. Understanding the primary care pathways will inform the debate on full patient journey pathways with the acute providers, where part of the journey is provided by a PCT provider service. It will also allow commissioners to better understand the PCT provider pathways.

What was the problem?

There was a range of provider services in the PCT which were either part of the 18 weeks RTT patient pathways, or had the potential to be redesigned and release resources to support 18 weeks RTT or directly improve services for patients.

The Patient Journey Analyser only provided information for the full 18 week pathways, with patients receiving treatment in an acute setting. There was no ability to look at the primary care part of the journey or look at primary care provided services - either as part of the total journey, or in isolation.

What they did to identify the cause of the problem

Managers and clinicians were clear that there was a need to review and redesign pathways within the PCT provider services, but only had raw data on which to focus the redesign projects.

Primary care data systems were considered the only way to capture meaningful data. Data was held principally on the main system (RiO), but also on other systems.

The NHS Institute for Innovation and Improvement worked with the PCT to look at ways of developing the upload facility of the No Delays Achiever toolkit to accept part pathway and PCT data.

What they did to improve service

Irrespective of 18 weeks, using the toolkit to analyse the pathways should enable organisations to provide a better service for patients, release resources and shorten the pathway for patients also admitted to acute services.

The main problem in collecting this data was that much of it does not exist on PCT systems. Many of the fields in the dataset are in common use in acute patient administration systems (PAS), but not in primary care systems, which make little use of agreed coding standards. In fact, of the 21 fields only 2 could be mapped exactly on RiO (requested date and discharge date). Another difficulty was that the service concerned used the activity coding on RiO to capture decisions made at a contact instead of activities undertaken at a contact; this meant that no treatment clock stop was being captured.

Uploading the data also proved to be more troublesome than expected. This was partly because the instructions provided required amending, and partly because local data codes had been used in place of standardised ones. Although this had been discussed with the NDA team, this was the first time this had been done for PCT data and it was not as straightforward as had been anticipated.

Namely:

- when replacing the specialty/HRG/OPCS/consultant/GP fields with local codes, text delimiters must be used, e.g. 'AT139', not AT139
- the data type of the date fields is actually date time, not date as shown. The format is not YYYY-MM-DD but YYYY-MM-DD 00:00:00
- the table for calculating the admitted and day case fields was incorrect
- all four HRG fields had to be filled.

The first data extract was made by extracting referral and associated appointment and discharge data for completed journeys over a set time period for the relevant teams. Min attend date, decided date and treatment date were all replaced with first appointment date. Specialty code and specialty were replaced with team data. All four HRG fields were replaced with an activity code and activity description, repeated to fill all four fields. Consultant/GP/count fields were left blank. Admitted cases and day case fields were generated (no admissions or daycares for these teams).

The second data extract is being developed. Completed journeys are now measured by matching starts with stops across the relevant teams, e.g. an 18 week pathway could commence in one team but end in another. It is fairly complex and needs some further work to create a usable dataset for the NDA tool.

What is it like now?

Treatment delivered has been added as an activity; this is used to capture a treatment clock stop. Leeds PCT is now developing some 18 week functionality within RiO, which will lead to transparent data capture and analysis. However, this will not capture the full NDA dataset.

This approach will give the PCT (and the Acute Trust) the data to facilitate and support in shifting the delivery of care away from the traditional setting of the hospital towards community based care.

This also means that more meaningful data will be entered into the community based information systems, which will allow for other uses, such as commissioning and audit.

Key points

- PCTs can now use the Patient Journey Analyser as a tool to analyse and review their own pathways, where either the pathway is part of the full patient journey, or where the patient journey is partly in the PCT provider services.
- The quality and range of pathway analysis is driven by the field completed in the source data. If more detail is required, the number of fields to be completed in the community information system may have to be increased.
- Most community information systems' data can be uploaded to the PJA for pathway analysis.
- Leeds will be using the toolkit to upload data from some of the other community information systems, using a similar approach, although it should be noted that this will require considerable Informatics input.

Tips for implementation

- The data on the PCT RiO system had to be amended to capture specific elements of the patient journey to record clock stops and starts.
- Be prepared to review the data recorded at source.
- Identifying the required outputs, for example the ability to review each step in the community pathway, should be clarified to ensure that the appropriate fields are completed in the source information systems.
- Although this was designed to upload data on the Leeds PCT RiO information system, the same principles apply to other data capture information systems, i.e. additional fields may have to be completed to allow the appropriate information to be collected and analysed.

Additional resources

Patient Journey Analyser

Acknowledgements / sources

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What is it about?

No Delays Achiever tools were used to gather data and analyse the current situation, then come up with solutions. The Value Stream Mapping tool was used as a basis for engagement and focus for identifying issues and blockages over the whole patient journey for hip and knee replacement. The 10 Patient Mapping and Identifying Blockages tools were used to analyse the situation further and understand the root causes of the problems. Finally, a solutions workshop using Creativity Tools was held to develop new ways of working, covering primary and secondary care.

How will it help achieve 18 weeks?

The No Delays Achiever tools provided the team with a methodology for gathering and analysing the data, and identifying solutions to help achieve 18 weeks. The Value Stream Mapping tool is a great way of demonstrating how each department functions in relation to the rest of the pathway. This reduces the risk of changes in one area impacting negatively elsewhere, which leads to a better overall outcome.

The Problem Analysis tool from No Delays Achiever helped to identify the root cause of the problem (rather than tackling a symptom), which leads to more effective and sustainable improvements. The Creativity Tools used at the solutions workshop helped the participants think beyond the usual answers to identify far reaching changes with a greater impact on 18 weeks.

What was the problem?

Lincolnshire PCT and the United Lincolnshire Hospitals Trust (ULHT) had highlighted orthopaedics as a priority pathway for review. An increase in the number of patients being referred, combined with known delays in the process, frequent cancellation of elective surgery and a shortage of beds was leading to frustration and delays.

What they did to identify the cause of the problem

The process of value stream mapping galvanised everyone from clerical staff to clinicians to get involved in the project. Several mapping sessions were held in a central location over a period of two weeks to allow all staff to view progress and add their comments. The map was the focus for discussion and used to probe where niggles and problems were occurring.

The No Delays Achiever data was used throughout the process; initially the data graphs confirmed that orthopaedics was the pathway that required attention, and that the second stage (from referral to decision to treat) was where the longest delays were occurring. Having carried out this initial measurement, the graphs were used to monitor how the changes being implemented were having an effect on reducing the average and the variation of patient pathway length for trauma and orthopaedics.

Further investigations were carried out using the 10 Patient Mapping and Identifying Blockages tools to find out just what and where the issues were. These were clustered into three main groups.

1. Referrals and Choose and Book
2. Practice not being 'joined up'
3. Communication



What they did to improve service

A day long solutions workshop was held, bringing together people from across the pathway to discuss each of the clusters of issues in turn. A range of creative techniques from the No Delays Achiever toolbox was used to help think beyond the usual answers, which resulted in over 60 ideas. These were graded according to selected criteria, and discussed further to create priorities and action plans. The actions for change covered four areas.

1. Develop more patient-centred care, where the patient is informed and plays an active role in treatment and rehabilitation.
2. Improve discharge planning to create a 'pull' process to reduce blockages downstream.
3. Create a fast, efficient referral system with patients on the right pathway, and being treated in the community as an option in some cases.
4. Improve communication systems within each organisation, between the organisations and externally.

What is it like now?

The first steps to encouraging patients to take on a more active role during treatment and rehabilitation have already been put in place. A review is currently taking place of all information provided to patients. They will now be provided with a diary to help them understand what to expect at each stage of their journey. They will be informed of their 'to come in' (TCI) date at first appointment and can plan accordingly.

A multi-disciplinary hip and knee team is being set up to manage the patient journey from the first appointment, to put in place an early plan for discharge and to manage patients' expectations.

Work was already underway to set up a musculoskeletal (MSK) service as a first option for many patients. This is being complemented by reviewing and potentially increasing the provision of extended scope physiotherapists and GPs with specialist interest in orthopaedics, which will reduce the number of referrals to secondary care. In addition, work is being undertaken with GPs to ensure that patients are fit, willing and able for surgery before being referred further, and that all the necessary tests and minimum data sets have been supplied when the patient attends the first outpatient appointment.

The No Delays Data is being used to:

- ensure that the focus of effort is in the right area
- provide evidence to those involved that change is required
- monitor the effects of changes being made.

Key points

- It is important to focus on the whole patient journey.
- Joint working between the PCT and Acute trust Takes for faster progress.

Tips for implementation

- Involve all the staff from the start of the process.
- Make contact with other NHS sites and review good practice to save re-inventing the wheel.
- As difficult as it might be, try to make time for workshops and team meetings; changes made as a result will be worthwhile.

Additional resources

Project Management Framework

http://www.nodelaysachiever.nhs.uk/ServiceImprovement/Tools/IT163_ProjectManagementGuide.htm

Stakeholder Analysis

http://www.nodelaysachiever.nhs.uk/ServiceImprovement/Tools/IT145_stakeholder.htm

Value Stream Mapping

http://www.nodelaysachiever.nhs.uk/ServiceImprovement/Tools/IT193_processmappingvaluestreammapping.htm

10 Patient Mapping

http://www.nodelaysachiever.nhs.uk/ServiceImprovement/Tools/IT233_TrackingWholePatientJourneyusingFilesorRecords.htm

Identify Issues and Blockages

http://www.nodelaysachiever.nhs.uk/ServiceImprovement/Tools/IT089_identifying_problems.htm

Managing Bottlenecks

http://www.nodelaysachiever.nhs.uk/ServiceImprovement/Tools/IT051_Managing_Bottlenecks.htm

Creativity Tools

http://www.nodelaysachiever.nhs.uk/ServiceImprovement/Tools/IT020_CreativeToolsAnOverview.htm

Acknowledgements / sources

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What is it about?

The No Delays Achiever was the starting point for a service improvement programme that delivered the 18 week RTT and reduced maximum waiting times for patients by up to 60%.

How will it help achieve 18 weeks?

By measuring the length of time taken at each stage of the patient journey, resources can be focused on the areas of greatest need to deliver significant service improvement for patients. By monitoring the ongoing performance of patient pathways, the results of process improvement activities can be captured, communicated and sustained.

What was the problem?

When South Devon Healthcare Foundation Trust was selected to be an early achiever site for 18 weeks, gynaecology was identified as a specialty that was unlikely to achieve this target in the allotted timeframe. The gynaecology team was determined to prove otherwise, but their problem was knowing where to start. Clinics were overbooked and there were long waits for appointments, but the Trust's data could not be readily analysed to show how the different gynaecology pathways were performing.

What they did to identify the cause of the problem

The Patient Journey Analyser in the No Delays Achiever was used to provide information about the average time taken and the level of variation for each stage of treatment along a number of pathways. It showed that patients were waiting 20 weeks for elective surgery, with the longest delay experienced between decision to treat and first definitive treatment.

An away day was held at the beginning of the project and a facilitator helped process map the key patient pathways and identify problem areas for redesign and improvement. Care was taken to involve representatives from all the main stakeholder groups involved in delivering the gynaecology service. A study was also undertaken to investigate demand and capacity. This showed that demand and capacity were in balance, and that the long waiting lists were not the result of insufficient capacity.

What they did to improve service

To achieve 18 weeks, the team needed to treat the backlog of patients and improve the current processes. They organised a period of increased activity for a defined period to reduce their waiting lists. They embarked on a service improvement programme to address the many issues identified during the away day. Activities to date which have improved the service and reduced delays include:

- introducing flexible sessions for consultants
- extending outpatient clinic hours and offering evening appointments by running three session days
- training GPs to manage some patients in primary care
- setting up one stop clinics for continence
- redesigning the administration services to support the new processes
- performing more procedures as day cases
- performing more procedures in an outpatient setting.



What is it like now?

A reduction in waiting times along the patient journey from 20 weeks to 11 weeks was achieved in 6 months by increasing activity to clear the backlog, redesigning patient pathways and applying some basic principles of process improvement, as described in No Delays Essentials.

Reduction in waiting times:

Outpatient = 18% reduction in waiting list size, 60% reduction in maximum waiting time, 14% increase in referrals (Apr-Jul 06 to Apr-Jul 07)

Inpatient = 52% reduction in waiting list size, 45% reduction in maximum waiting time

Day surgery = 52% reduction in waiting list, 45% reduction in maximum waiting time

Waiting times from decision to treat to treatment have already been reduced from ten weeks to five weeks and there are actions in place to reduce this still further. The team is determined to reduce all unnecessary waits. They are now looking at the referral stage and are working with primary care to improve the efficiency of the process, remove delays and improve the patients' overall experience.

The impact of improvements on the length of the patient journey can now be monitored using the No Delays Achiever uploaded with local data.

Key points

- Use data to inform your decision making.
- Involve all stakeholders.
- Monitor and communicate results.

Tips for implementation

- Use the No Delays Achiever at the very beginning of a service improvement project to analyse current processes.
- Do not make assumptions about the underlying causes of problems. Diagnose the cause, measure and analyse.
- Engaging and involving the right people underpins successful change. This team was able to successfully implement change because they had strong and effective leadership and all the major stakeholders were involved. They developed a shared vision and worked as a multi-disciplinary team.

Additional resources

The following tools provide further details about some of the steps described in this case study.

- Process Mapping
- Quick Introduction to Demand and Capacity
- Comprehensive Guide to Demand and Capacity
- Clinical Engagement
- Identifying Problems

Acknowledgements / sources

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What is it about?

The application of a clinical systems improvement (CSI) methodology to manage patient discharge and improve patient flow to reduce length of stay. The impact of improvement efforts showed a significant reduction in length of stay for emergency medical patients from 14 days down to 5.8 days over 7 months.

How will it help achieve 18 weeks?

Reducing length of stay by improving patient flow.

What was the problem?

Patients were experiencing delays to treatment and increased lengths of stay in hospital because discharge was not taking place as soon as the patient was medically fit.

What they did to identify the cause of the problem

- The hospital Trust used clinical systems improvement methodology to analyse the patient journey.
- They began by analysing the baseline situation in order to understand the system before changes were brought in.
- The analysis confirmed that there was more variation in patient discharge than admission.
- Drilling down process levels to identify the causes of variation showed that patterns of discharge throughout the day peaked in the late afternoon.
- Further analysis of discharged patients demonstrated that variation was caused by operational processes currently in place. It was therefore within the Trust's control to reduce variation.
- Baseline high quality data enabled the Trust to identify areas in which to focus improvement efforts.

What they did to improve service

- The Trust piloted improvement strategies in non-elective patient services.
- Ward based multi-disciplinary improvement teams were set up to increase discharges before midday and at weekends, and to support improved nurse led discharge.
- Specialist service improvement teams were formed in response to delays identified through process mapping. They addressed one specialty, such as physiotherapy, pharmacy or occupational therapy (OT).
- Meetings were made more effective to facilitate proactive patient discharge.
- Date of discharge was predicted to replace a reactive way of working with a proactive approach to managing beds.
- Services were redesigned to smooth out the patient journey.
- Staff roles were redesigned to support efforts to improve discharge processes.

What is it like now?

The impact of improvement effort shows a significant reduction in length of stay for emergency medical patients, from 14 days down to 5.8 days over 7 months.

- Multi-disciplinary ward based improvement teams are now operating in all specialty wards.

- OT referral was identified as a bottleneck in the system. The OT team has reviewed their referral process and reduced the mean wait from date of admission to receipt of OT referral from 9.7 days to 3.6 days.
- 8.30am handover meetings are now attended by senior decision makers (consultants and specialist registrars) so that patients are reviewed and decisions made about their treatment and discharge early in the day. This has also provided an opportunity for medical and nursing teams to review patients together. Representatives of other disciplines attend where possible, facilitating multi-disciplinary teams and making it easier to implement plans for patients' discharge.
- A predicted date of discharge is identified for each patient within 24 hours of admission.
- The medical assessment unit (MAU) has been relaunched with a larger nursing team and a designated MAU physician. The MAU now triages all patients prior to transfer to specialty wards. The unit initiates treatment with the aim of smoothing the patient journey through the hospital. Each patient in the MAU receives a treatment plan with a predicted date of discharge and a full multi-disciplinary team assessment within 12 hours of admission; they also have immediate access to diagnostic tests and investigations. MAU staff aim to discharge or transfer 50 per cent of patients within 24 hours of admission. They aim to treat patients effectively enough that 30 per cent can be discharged without requiring further hospital treatment.
- The medical day unit (MDU) is being developed for several patient groups that would benefit from day case treatment rather than inpatient admission. These groups include older adults and patients requiring gastrointestinal, respiratory and endocrinology treatment. Predictive data suggests that the unit could reduce length of stay for these patients by as much as 13 per cent.
- Nurse led discharge has been established on all specialty wards following a successful pilot study. Nursing staff are being supported to make discharge decisions within agreed clinical criteria. The nursing team aims to increase the number of patients discharged at the weekend, in order to reduce variation in discharge levels throughout the whole week.
- 'Mega firms' or consultant 'clusters' are specialty teams that have been formed to provide care to patients in a particular clinical area. Communication amongst medical staff has improved and patients now receive more consistent and co-ordinated care.
- A 24 hour service has been developed so that patients have consistent access to care throughout the day and night. The on-call night duty team and the patient support team are now located adjacent to the MAU in order to improve communication and co-ordination of patient care out of hours.

Key points

- In a complex organisation like a hospital, a change in one area will have an impact on the whole system.
- Monitoring the whole system is vital to ensure that the potential for high impact change is being directed towards improving the whole system.
- Baseline measurements were taken to establish the improvement strategies. From the month these strategies were put in place, there was a significant reduction in the variation of discharge rates; a reduction that has been maintained.

Tips for implementation

- Managing variation in patient discharge leads to high impact change: it reduces length of stay for patients.
- Because there is more variation in patterns of patient discharge than in patterns of patient admission, (due to processes such as ward rounds and testing) patients' lengths of stay are highly variable and unpredictable.
- Variable and unnecessarily prolonged length of stay affects the whole hospital system: bed availability, transfers from A & E, clinical outcome and the patient experience.
- Understanding the causes of variation means that it can be managed and reduced.

Additional resources

The following tools provide further detail about some of the steps used in this case study.

- CSI
- Variation
- Discharge Planning
- Process Mapping
- Role Redesign
- Overview of Patient Flow

Acknowledgements / sources

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What is it about?

A classic demand and capacity study in Hull and East Yorkshire. The project team assessed demand, capacity and activity for echocardiography as a way of reducing the backlog of patients and waiting times. This baseline assessment then informed decisions on how best to go about improvements.

How will it help achieve 18 weeks?

Capacity and demand is a key approach to meeting 18 weeks. It reduces backlogs and waiting times, as well as preventing them from developing in the first place. The team in Hull and East Yorkshire were convinced that they did not have enough capacity and that this was the cause of long waiting times. They carried out this analysis to demonstrate the need for investment. To their surprise, a mismatch in capacity and demand was the root cause, combined with some inefficiency in their systems.

What was the problem?

The East Riding and Hull CHD Collaborative formed in September 2000; the principles and methodology that they used are still highly relevant today. Having identified heart failure as a problem area, they arranged an initial process mapping session to look at the pathway. As a result, it became clear that transthoracic echocardiography was causing the major bottleneck which was restricting patient access to appropriate care.

Outpatient waiting times were between five to six months, with inpatient waiting times in excess of ten days. Many inpatients were discharged without having their echocardiogram performed. These patients became outpatients, putting a further strain on the outpatient service.

It was initially thought that these long waiting times for echocardiography were caused by a shortfall in capacity, so plans were made to buy more machines. However, after a baseline analysis, they found that the problem was actually under utilisation of what proved to be sufficient capacity.

What they did to identify the cause of the problem

Before applying for more capital and revenue spending, the team felt that an assessment of demand, capacity and activity would be appropriate, if only to confirm the need for new resources.

Capacity was measured in slots / month. One echocardiography machine with a trained technician was available for nine half day sessions per week. This worked out at 280 slots / month. Working at 100 per cent capacity is not only almost impossible, but leaves no spare capacity for emergencies, so the team aimed for a capacity of 80 per cent of the maximum fluctuation in demand. This should result in a planned 80-85 per cent utilisation of the total capacity, which allowed time for urgent cases and flexibility when scans took longer than expected. 80 per cent capacity = 224 slots / month.

Demand was also measured in slots / month. Over a three month baseline period, all requests were scrutinised and allocated a slot for either inpatient or outpatient work. Activity was also measured in slots / month. Over the same three month period, the team noted the actual work carried out.

They found that demand was 209 slots / month (108 inpatients and 101 outpatients). However,



activity was only 184 slots / month (66 per cent utilisation of capacity, a shortfall of 40 slots). Waiting times were 145 days for outpatients and 10 days for inpatients, with up to 40 per cent of inpatients discharged without having a scan. The 40 per cent of inpatients were put onto the outpatient waiting lists.

What they did to improve service

The team agreed that they needed to redesign the service and plan more carefully to maximise available capacity. They began a three month improvement study analysing where referrals were coming from and when, noting any clear patterns. Capacity remained the same during the study.

They found that many patients were admitted at the weekends with a lot of consultant ward rounds on a Monday. This resulted in a high number of requests for echocardiography late on Monday / early Tuesday each week. Accordingly, the team stopped doing planned slots on Tuesdays to meet the inpatient demand from Monday.

In the past, the team had booked outpatient slots every day of the week, the theory being that when they had finished outpatient demand, they would deal with inpatient demand – but it didn't work that way. So, towards the end of the week, the team scheduled a couple of afternoons for inpatient slots.

The team decided to focus their improvement efforts on their booking system. On Tuesdays – the peak for inpatient demand – the team didn't book any outpatient slots. Instead, slots were scheduled for this predictable demand. In addition, they built in capacity to deal with inpatient demand for the other days of the week.

Inpatients admitted over the weekend, whose consultants made a decision that they needed an echo, were booked into a timed slot. The team then sent a list of the patients scheduled for an echo to both porters and wards with the time of their slot. This made sure that patients turned up on time (as the hospital is on 13 floors, this was very important)! Technicians' time was freed up as a result, giving them more time to do imaging work.

What is it like now?

In the final quarter of 2001, the values were remeasured. Demand had fallen from 209 slots / month to 173 slots / month because of the reduction in outpatient demand (from 119 slots / month to 67 slots / month). This was almost all due to the reduction in the overflow of patients who had failed to have their studies as inpatients. Since these were now done as inpatients, demand for outpatient slots had fallen.

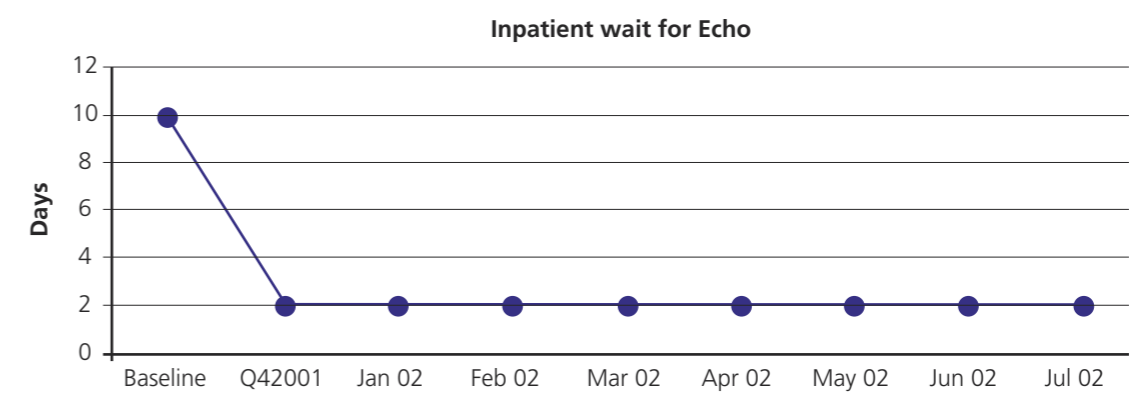
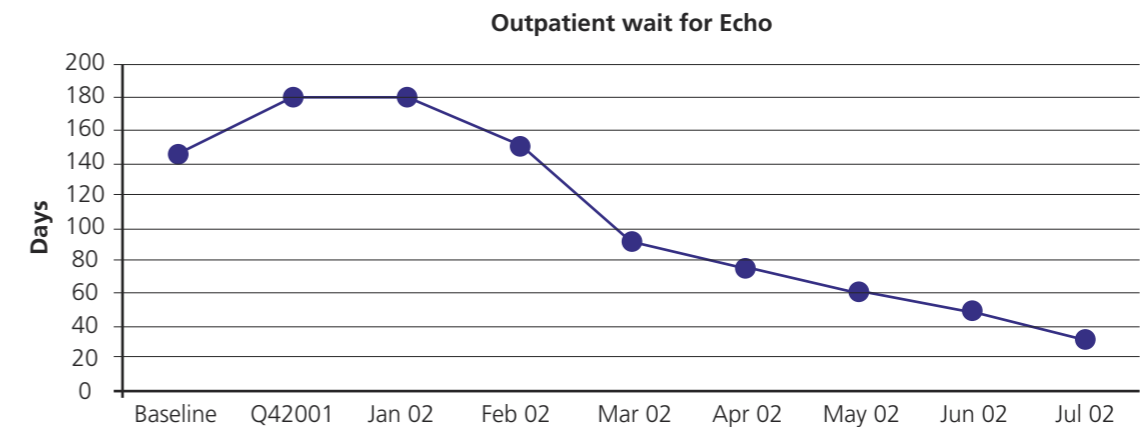
Inpatient demand remained almost static at 101 slots / month compared with 108 slots / month in the baseline period.

Activity had increased from 184 slots / month to 229 slots / month (82 per cent of capacity). Inpatient activity almost exactly matched demand at 100 slots / month. Outpatient activity was 129 slots / month – 10 slots less than demand, meaning that the numbers on the waiting list started to reduce.

In the first quarter of 2002, the values were as follows:

- total demand: 176 slots / month with 100 for inpatients and 76 for outpatients
- total activity: 247 slots / month (88 per cent of capacity) with 97 slots / month for inpatients (97 per cent of demand) and 150 slots / month for outpatients.

In line with best practice, they have kept activity at 88 per cent of demand.



Key points

- This team had a strong focus on analysing the problem through a baseline study. They investigated demand, capacity and activity and didn't make any decisions based on previous assumptions until they had seen the results.
- They understood the effect of variation, considering and planning for the predictable (Monday morning) demand from emergency inpatients.
- The team involved all staff in suggesting solutions to the problems and redesigning the service.
- They made sure that changes stuck by measuring the impact of what they were doing as the graphs show.
- The team did enough analysis and improvement to meet their targets.
- They didn't overcomplicate things in the early stages of continuous improvement.

Tips for implementation

- Beware the received wisdom that long waiting lists are a capacity problem - they often are not!
- Measure capacity, activity and demand in the same units (minutes, hours, patient slots etc.).
- Get the shop floor involved; they often know the problems and empowering them to alter the process will improve the service.
- Before you make any changes, get baseline measures so you can measure improvement.
- Use PDSA (Plan Do Study Act) methodology, starting small, to test improvements.
- Get the most sceptical member of staff involved: when they are converted to the improvement process, almost everybody follows.

Additional resources

- Carrying Out a Capacity and Demand Analysis
- Plan Do Study Act
- To get the shop floor involved, you may want to use the following tools: Map Outpatient Journey as a Group; Brainstorming and Staff Perception
- To get the most sceptical member of staff involved, persistence and some of the following may help: Working with Resistance, Clinical Engagement and Commitment, Compliance and Enrolment

Acknowledgements / sources

John Caplin, Hull and East Yorkshire Hospital Trusts



What is it about?

This case study details the steps taken by staff at Dorset County Hospital to increase overall radiology capacity and reduce delays for patients by training theatre staff to use imaging equipment.

How will it help achieve 18 weeks?

The initiative helped to achieve 18 weeks by increasing overall radiology capacity by 7 hours of radiographer time. By removing the requirement for a radiographer to be in theatre for a whole day spinal list, the radiographer is available to support other areas, such as orthopaedic outpatients.

What was the problem?

To deliver 18 weeks for orthopaedics, additional outpatient clinics were set up. Radiology capacity was limited in Dorset County Hospital and the radiology department was not always able to support all the additional activity scheduled. With increasing outpatient activity, multiple theatres requiring x-ray and with a limited number of radiographers, some patients faced long waits. Surgery on anaesthetised patients was sometimes delayed whilst the team waited for a radiographer who was deployed elsewhere. A system to pre-book radiographers did not solve this problem because variation in operating time combined with unscheduled demand from emergency surgery and trauma meant that elective procedures were still frequently delayed.

What they did to identify the cause of the problem

The radiology team analysed the surgical demand. A review of the documentation, screening times and doses of radiation used during spinal surgery found that a radiographer could be in theatre for two hours per case and apply radiation for less than two minutes. A whole day spinal list required a radiographer to be present for a 7-9 hour list - for less than 15 minutes of work.

The requirement for images during spinal operations was unpredictable, so the radiographer was needed in theatre throughout the whole procedure. From a radiographic point of view, the images required were routine, single plane, low dose images of the lumbar spine.

What they did to improve service

To improve the service, members of the theatre team were trained in the use of the image intensifier for the spinal operations performed in theatre.

Before any changes were made, discussions were held between the radiation protection adviser (RPA), the head of radiology, theatre management and the lead consultant spinal surgeon to ensure everybody was in agreement with the concept, and that the proposal adhered to radiation safety regulations.

The role extension was advertised to the orthopaedic theatre staff and four senior members expressed an interest in being trained for the role.

A comprehensive training programme was developed to cover theory and practice and was delivered by designated trainers from the imaging and medical physics departments. The trainees were examined using an assessment program called CALRAD. This computer assisted learning program was developed by a consortium of British universities to educate staff that work with radiation, about the principles of radiation protection of patients. Upon completion of the theoretical component of the training, a senior radiographer, who had been designated the radiation protection supervisor (RPS), oversaw the practical aspect of the training programme.

Each trainee was issued a logbook to document all cases. Each case was assessed and signed if the performance was considered satisfactory. The trainee could only commence independent practice once the RPS was satisfied that the individual was competent to practise alone and had completed the logbook. This required a satisfactory assessment in ten procedures.

Protocols were devised by the radiology department in conjunction with RPA to ensure that the working practice of these new operatives met radiation regulations IRR 99 and IRMER 2000 and provided a safe level of service. The RPS constantly monitors dosages of radiation used in each list and regularly inspects the equipment used.

What is it like now?

The presence of a trained member of staff in theatre at all times has reduced delays during operations and has made it possible to extend the operating day and to operate at weekends without having to book additional radiographer cover.

The extended role for the theatre staff has been both challenging and rewarding. They have increased responsibility and feel they have become a more integral part of the spinal team. This has delivered greater job satisfaction.

Overall, this initiative has strengthened the spinal team. In part this is due to the support and cover for breaks that team members provide for each other during the day, which eases stress and tiredness during a long list.

The radiographer is now available to support other theatres and orthopaedic outpatient clinics allowing the spinal service, orthopaedic outpatients and other specialties to run more efficiently.

The radiographer can make more efficient and effective use of their skills and time by performing more complex procedures, such as CT and interventional work.

An additional benefit is that the trained theatre staff are able to use their skills to support the pain service, which has similar imaging requirements. This has effectively increased the radiographic cover by four members of staff and provided more flexible booking of pain lists, including dedicated day case sessions at weekends.

Key points

Involve all stakeholders. In this case study the key stakeholders were the radiation protection adviser (RPA), the head of radiology and members of the radiology department, theatre management and staff and the lead consultant spinal surgeon.

Develop a comprehensive training and development programme for the theatre staff. A key part of the role extension is the safety aspect of using radiation, maintaining a designated area, ensuring staff follow the local rules and an understanding of the physics involved.

Tips for implementation

Staff selection is very important. In Dorset County Hospital the criteria for staff selection included:

- an understanding of orthopaedic spinal surgery procedures and caseload
- an ability to understand radiation physics
- the authority to create and supervise a designated area
- the ability to ensure the safety of all staff and patients.

Organise the staff rota so that at least two senior members of staff are present in theatre; one to operate the image intensifier and one to run the theatre.

Rotate trained members of staff so that they also perform other duties for which they are trained, such as scrubbing and covering anaesthetics, in order to prevent tedium and to retain skills.

Additional resources

- Stakeholder Analysis
- Role Redesign

Acknowledgements / sources

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Janine Courtaux, Orthopaedic Theatre Sister, Dorset County Hospital

Gill Lane, Senior Radiographer for Theatres, Dorset County Hospital



What is it about?

The model helps to estimate the required theatre capacity which will meet the demand for elective surgery. It also facilitates people really thinking about how capacity is utilised.

How will it help achieve 18 weeks?

It helps determine the capacity needed to keep the waiting list constant, which is a prerequisite to the 18 week patient journey. This helps to sustain 18 weeks and help teams compare the current capacity by specialty with what the model says they need.

What was the problem?

The paediatric congenital cardiac surgical pathway had high waiting times for surgery. This was breaching waiting time targets and guidelines on right age for surgery and the timing of surgery.

What they did to identify the cause of the problem

The team undertook a process mapping workshop that started to highlight specific issues and areas of concern. This involved over 30 staff from all parts of the pathway who did patient walkthroughs and case note reviews. The team also used the capacity model to understand whether they had enough theatre capacity in relation to operating hours to meet the demand - this actually demonstrated that capacity was sufficient. The capacity model says that if a team is working efficiently, this is the capacity needed. The power in linking process mapping with capacity modelling, which enables the team to play with various scenarios, (doing x has y impact) shapes the system.

A team from the hospital also visited and benchmarked their performance against a comparable centre, looking at the systems and processes they had in place. The perception that there was not enough capacity was disproved. The team acknowledged they did not need more sessions, just to streamline people, systems and processes.

What they did to improve service

The pathway staff representatives involved in the mapping and modelling set up a steering group. Work streams were identified and clinical champions and clinical leads established. They invested time in engaging clinicians and senior managers and staff representatives. They held workshops to discuss the detail of the way forward, and have agreed a plan to improve four key areas.

1. Waiting list management
2. Scheduling patients
3. Pre-operative assessment
4. Theatre efficiency

What is it like now?

The team has got sign up from the Trust Management Board to make service changes in key areas identified.



Implementation leads have been appointed at senior management and clinical director level with service improvement / project management support. Anticipated benefits: a pathway that is continually planning ahead, proactively managed with clear leadership. Patients will be treated within the optimum timescales and will avoid unnecessary, lengthy waits. The pathway will operate within national and local policy guidance. Breaches of the waiting times standard will be eliminated and cancelled operations will be reduced. There will be benefits associated with robust listing and scheduling, such as improved utilisation of theatre resources, improving efficiencies and eliminating waste.

Key points

The following key points concern the capacity planning aspect of the project only.

1. The model uses demand for surgery to drive the potential capacity required. The model does not ask, 'what capacity do we have or what did we use last year?' Instead, it uses an estimate of demand; patients being added to the surgical waiting list on a weekly basis. It uses the typical level, (given by the average) and also the weekly variation.
2. The model highlights the effect of flexible use of capacity. The traditional approach to scheduling theatres is to allocate regular sessions to named consultants. In this case, each consultant has to manage their own variation in demand within their own lists. The model contrasts this with the effect of specialties or groups of specialties being given regular sessions. Here consultants can flex their personal sessions within the overall envelope of their specialty allocation. The model shows the typical savings in terms of weekly sessions that can accrue by using capacity in a more flexible way.

Tips for implementation

General

1. As any capacity modelling is likely to be as part of a change project, all the usual guidelines for successful change management programmes apply. Thinking of it as a change project rather than a piece of technical wizardry will remind you to concentrate more on the people aspects, rather than just worry about getting the data right.
2. It's more important to follow the two principles of demand led capacity and flexible use of capacity in any work you do, rather than get hung up on which model to use.

People aspects

1. Get senior clinician support before getting into the data analysis. Your chosen champion should really understand the model and its limitations. This is important because no model perfectly represents real life, and they can help you identify any potential pitfalls in the approach you may have chosen. They will also be invaluable later in promoting the results.
2. Even simple models contain a fair few assumptions, so resist the temptation to unveil your work to the unsuspecting world in one go. Use a phased approach. Explain the model and how it works using example data. This should encourage a debate about which assumptions to make before people get anxious about the results. Then present some initial results, but be prepared to rework the data in the light of feedback. Only now are you in a position to present the final results.
3. Those affected by any change will naturally get anxious about the results of your capacity modelling. If you get a hostile reaction or merely a sceptical one, ask people which assumptions they don't like. Keeping the focus on assumptions rather than results means that you can have a constructive discussion that will hopefully lead to agreement.
4. Make sure that people understand that the variation in their demand has a big impact of capacity. For some this is a novel concept. Use the charts in the Excel model to show the effect graphically. The red lines show the expected range of demand and at an individual consultant level can be quite wide.

5. Explain what you are wanting to achieve to those from whom you are wanting data; typically this will be the trust information department. They can guide you in how reliable it is and highlight any quirks in the way the data has been collected. You may need to revise your plans if the data you want is not available or robust enough to use.

Technical aspects

1. The Excel model uses this variation to set capacity levels and the user has three options. Selecting 'average demand' means you are ignoring any variation, often not a sensible course. Selecting 'sprint capacity' means you are allowing for some variation, but you will need a waiting list to mop up the rest so this option useful for elective surgery. Selecting 'immediate response' means that you can cope with nearly all the demand that arrives and is useful for emergency surgery.
2. The measure of demand that is most commonly available is 'additions to the waiting list'. You must watch out though for any specialties or consultants that have a proportion of elective work that bypasses the waiting list. Check for any other local issues that might affect your data.
3. Not all patients who are added to a waiting list get treated; some will be removed because they have changed their mind or are unfit for surgery. You will need to apply a removals other than treatment rate (ROTT) to your demand data, or you will be overestimating the demand for surgery.
4. Typically we measure demand in numbers of patients, but theatre capacity in hours. So we need to convert one of them. I prefer to convert demand into hours, but you can choose either. Unless your waiting list IT system already has procedure times incorporated, you will need to convert the procedure into a time equivalent, for example adding 1 hip replacement to your waiting list means 2.5 hours to the list. No two procedures take exactly the same time, so you will have a range of times to choose per procedure. I have taken the 75th percentile time rather than the average because the range of times is not symmetrically spread. I've also found it useful to show the spread graphically.
5. There is also usually a choice in how the procedure time is measured. Do you include or exclude anaesthetic time for example? Most modern theatre information systems collect up to a dozen different times for each procedure (time into theatre, start of anaesthetic etc.) so you can be spoilt for choice. Choose a measurement that is acceptable to your clinical champion, but before committing yourself, check that the data is reliable and complete. Some data fields can be intermittently filled in.
6. If you calculate the demand times outside the model and simply paste in the relevant data into the Weekly additions sheet, set the 'time per case' on the Cons Params sheet to 1. Alternatively you can paste the number patients added to the list in which case you need to add the consultant average or 75th percentile time into the 'time per case' column.

Additional resources

- Operating Theatre Capacity Model
- PowerPoint slides describing how to use the model
- Example of the operating theatre capacity model populated with paediatric cardiac data

Acknowledgements / sources

Contact for capacity model: Mike Davidge, Director for Resources, Analysis & Modelling, Making Leeds Better Programme
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Contact for Paediatric Cardiac Project: Sarah Bailor, Service Improvement Facilitator, Performance Improvement Team, Leeds Teaching Hospitals NHS Trust
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http://www.leedsth.nhs.uk/performance_improvement



What is it about?

How the team at Peterborough was able to speed up a cataract service through direct access to the surgery booking system and by removing unnecessary steps in the patient journey.

How will it help achieve 18 weeks?

The more steps there are in a process, the longer it will take. By removing non-value adding steps, for example cutting out the GP referral and booking a date for surgery on the spot with patient involvement, the process is speeded up making it more efficient and economic.

What was the problem?

At the start of the project, there were long waiting times and numerous patient journeys involved once the optometrist had identified a need for surgery. The service was not patient friendly and was expensive. In addition, there was poor communication between professionals and no agreed referral criteria.

What they did to identify the cause of the problem

The team applied for national development monies to look at designing new ways of working. Despite the fact that they were unsuccessful, they decided to go ahead with the redesign work.

The team had good support from the Trust's transformational change team and the key stakeholders were identified and involved from the start. The whole patient pathway was examined and numerous non-value adding steps identified including:

- referral to the GP by the optometrist to initiate referral to the ophthalmologist
- referral to outpatients to determine that cataract surgery was required (the third opinion)
- pre-op assessment in clinic
- follow up in outpatients.

What they did to improve service

The pathway was redesigned so that the patient attended the optometrist. If the need for cataract surgery was identified, the optometrist then contacted the hospital. The patient was given an appointment for surgery on a date of their choice. The patient then attended for surgery. Those who required a second cataract operation were assessed before they left the hospital after having the first cataract done and were given an appointment for between 6 and 13 weeks for the second surgery. Patients were treated in order of incoming telephone requests and subject to their choice of surgery dates.

All consultants worked in a pooled listing way managed by the ophthalmic co-ordinator. The consultant secretaries were resistant to giving up the management of their individual waiting lists, partly due to the fact that their pay grades and bandings were enhanced for undertaking this role, and partly because they missed the contact with the patients.

Other improvements have included:

- situating the biometry machine close to theatre to enhance flow. Ensuring everything is sited in close proximity has meant that the team no longer require porters
- standardising paperwork
- standardising training.

What is it like now?

The changes have improved both surgery and outpatient waiting management. Timescales from optometrist referral to operation and discharge now range between 6 and 13 weeks. 1184 new outpatient appointments are available. Patient satisfaction surveys have been undertaken with over 95 per cent reporting satisfaction with the service.

The ophthalmic co-ordinator role is pivotal to the success of the service, as is the enhanced working relationships between the optometrists and the ophthalmologists.

Annual training of optometrists is undertaken to ensure optometrists new to the area know how to work the pathway. Updating training is undertaken for existing optometrists as procedures are refined and updated.

The team have adopted a continuous improvement approach and keep developing. The next plan is to review the outpatient paperwork.

Key points

- The willingness of both the consultants and the optometrists to change was key to success.
- Mapping the whole patient journey enabled the team to identify non-value adding steps.
- All stakeholders were identified and involved at the outset and a pilot was initiated first.

Tips for implementation

- Culture change is the most important element - and it is not easy.
- Multi-disciplinary team working is essential.
- Keep your changes patient focused.
- Remember that understanding requires time, energy and stamina.
- Senior management commitment is key.

Additional resources

The following tools provide further detail about some of the steps used in this case study.

- Focus on the Whole Patient Journey
- Pool Similar Work Together and Share Staff Resources
- Keep Things Moving: See and Treat Patients in Order
- Mapping Processes and Patient Journey: Overview
- Stakeholder Analysis
- Clinical Engagement
- Commitment, Enrolment and Compliance
- Understanding Resistance

Acknowledgements / sources

With thanks to Sr Debbie McCarter, Ophthalmology Department, Peterborough and Stamford Hospital NHS Foundation Trusts
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What is it about?

An outpatient clinic was redesigned and a new nurse practitioner role introduced, which reduced delays by increasing capacity.

How will it help achieve 18 weeks?

Sharing staff resources more effectively through a redesign of roles reduces patient waiting times and enables more patients to flow through the system. This in turn contributes to keeping things moving through the system, reducing delay in the whole patient journey.

What was the problem?

Trauma and orthopaedic outpatient clinics were frequently overbooked, causing delays for patients and the overrun of clinics. This delayed the patient journey by reducing flow through the system.

What they did to identify the cause of the problem

- Staff in the unit analysed audit data to look for factors contributing to clinic overbooking.
- A contributing factor to delay was an insufficient number of doctors to see all the patients.

What they did to improve service

- Redesigned the nurses' role.
- Set up a nurse led orthopaedic service.
- Networked with other trusts to support the development of redesign solutions.
- A mentoring scheme of medical consultants was put in place to support the nurses in their new role.

What is it like now?

- On a weekly basis, doctors now see up to 20 more patients with new and complex injuries than before the redesign.
- In the trauma clinic, specially trained nurse practitioners use care protocols to examine and treat patients with specific injuries, while a doctor examines patients with other injuries.
- A nurse practitioner sees patients who attend the arthroplasty clinic: first pre-operatively, at hip and knee classes and then on the ward for surgery, as well as providing post-operative follow up care.
- The continuity provided through this service improves the quality and experience of care for patients.
- Nursing and medical staff have enjoyed the opportunity to work together in a new way.

Tips for implementation

- Base changes on the use of care systems, pathways and protocols.
- Any changes must ensure clarity, accountability and safety for the patients and staff.
- Maintain close links with other relevant developments in human resources (HR).
- Take account of the need for continuing personal and professional development and lifelong learning.
- Experience and training from one post should be recognised, accredited and used for development.
- Build role redesign on the growing evidence and experience of good practice.

Additional resources

The following tools provide further detail about some of the steps used in this case study.

- A Comprehensive Guide to Demand and Capacity
- Keep the Flow: Reduce Unnecessary Waits
- Protocol Based Care
- Role Redesign
- Discomfort Zone
- Pre-operative Assessment
- Learning from Change

Acknowledgements / sources

Grantham and District Hospital, United Lincolnshire Hospitals NHS Trust

Redesigning the Vascular Surgery One Stop Clinic at Good Hope

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What is it about?

Providing a better service for patients, reduced stress for staff and increased capacity to provide resilience to cope with unpredictable changes in demand without increasing resources. A new software tool specifically designed for healthcare, the Care Pathway Simulator, was used to identify the problem.

How will it help achieve 18 weeks?

By reducing new patient visits from three to one, patient flow was increased and things that didn't add value to patients were reduced.

What was the problem?

Following an initial team-wide strengths and weaknesses assessment, the team, led by the consultant vascular surgeon, audited existing activity, case mix and waiting times using this as the basis for a redesign of the service. They recognised that continuous quality improvement principles have a place in the constant review, assessment and improvement of healthcare delivery. The team identified that the processes in their service had bottlenecks, and therefore limited capacity.

Initially, the team used the PDSA (Plan Do Study Act) method but found that this had limitations. It was not possible to predict the effect of a proposed change before implementation or to compare a range of proposed options objectively. The team decided to adopt a research style approach that would provide objective evidence of benefits to support any proposals. They aimed to identify the 'least effort, maximum benefit' changes, as the only resources available were their own free time and desire to improve the experience for patients and staff. For them, the PDSA method was insufficient for the pace of change and complex design their systems required. They needed a more robust technique.

What they did to identify the cause of the problem?

The team worked with SAASoft Ltd to apply advanced IT to clinical process redesign using the evidence based principles of a formal research methodology. SAASoft Ltd developed a new tool specifically for use in healthcare: the Care Pathway Simulator (CPS). This tool was used to assist the redesign of the vascular surgery one stop clinic within the hospital.

The team considered these three components as part of their work:

- the work list of patients (demand)
- the pathway or sequence of actions required to process each patient
- the resources required to perform each action (capacity).

With this information, it was possible to simulate an outpatient clinic and to predict how it would perform over a range of conditions.

The team needed data for the three components, so their first task was to audit the existing outpatient service activity and waiting times to provide a baseline from which subsequent changes could be measured. In addition, this enabled them to conduct a detailed case mix audit to identify broadly the types of patient presented to the clinic.

From this audit, a minimum set of patient pathways was identified and each one formally defined by following individual patients and recording what happened to them.

Analysis of the audit database showed that, in terms of their resource requirements, there were four broad classes of patient attending the vascular surgery clinic. This meant that the pathway mapping process only had to be done for a small number of patients to define the sequence of resource requirements and the mean and variance of the essential intervals.

What they did to improve service

The CPS was used to test proposed clinic booking schedules that were designed to minimise patient waiting, reduce the number of clinic overruns and maximise clinic capacity.

The least complex pathway took around 15 minutes and used only 2 resources, whilst the most complex took over 90 minutes and used all the resources in the clinic. The process maps were converted to process flowcharts using the graphical interface of the CPS tool, along with a definition of the types of resource that were needed and the amount of each available. The final model was validated by comparing the CPS prediction of clinic finishing time with the actual finishing time for a number of real clinics.

The CPS tool was then used to simulate a range of hypothetical outpatient booking schedules. The best were identified using objective criteria that included total patient waiting time, resource activity, clinic finishing time and number of patients seen. This approach of running a series of virtual experiments provided a useful insight into the behaviour of the whole system from all aspects. The interactive design of the CPS tool avoided the need for sophisticated optimisation algorithms and allowed the operator to find a solution with the required performance and resilience to cope with the known demand and case mix variation quickly.

The final output was a booking schedule that predicted a 40 per cent increase in maximum clinic capacity in terms of the number of patients that could be seen. Although surprising, it was the result of the pathways of individual patients interweaving in an elegant and efficient dance with the available resources.

The new schedule was implemented very simply as a paper based diary. The clinic clerk just had to match the assigned patient category with the next free slot in the schedule of that category to get the starting time, and then make bookings in the patient administration system for the required resources (i.e. doctor, nurse, and technologist) as directed by the schedule.

What is it like now?

The Care Pathway Simulator has enabled the staff of the vascular surgery clinic to provide a better service for patients, a better working environment and improved use of resources.

The reorganisation of the outpatient service as a one stop clinic now means that a new patient has an assessment, investigations and review in one visit instead of three. This has improved the patient experience and reduced administrative overheads.

The increased maximum capacity created by the optimised scheduling template meant that the clinic had enough resilience to absorb the inevitable unpredictable variation in demand, such as urgent appointments.

The informal feedback from the staff was that it just ran better; that the days of late finishes, missed lunch breaks and frustrated patients appeared to be over. The new system was piloted in November 2004 and the subsequent audit showed that the clinic behaved just as predicted. Even when booked to maximum capacity, the clinic was busy but not frantic and still finished on time.

Key points

- It is necessary to find the right service improvement method for the identified problem.
- There can be simple solutions to complex problems, e.g. new schedule as a paper based diary managed by the clinic clerk.
- Capacity can be increased without necessarily increasing resources.

Tips for implementation

Success is due to:

- a clinical team that is focused clearly on delivering better care for patients by improving the whole process of care
- a supportive environment where innovation is encouraged and change is facilitated rather than forced or blocked
- the development of multi-skilled personnel and cross boundary thinking to bridge the knowledge and communication voids between different groups within the team and wider organisation.

“By combining innovative ICT with clinical process redesign we have achieved the elusive win-win-win outcome: a better, faster and cheaper clinical service.”

Additional resources

The following tools provide further detail about some of the steps used in this case study.

- Variation
- Discharge Planning
- Process Mapping
- Overview of Patient Flow
- Comprehensive Guide to Demand and Capacity
- Quick Introduction to Demand and Capacity
- Protecting the Bottleneck
- PDSA
- Reducing Variation in Clinical Pathways to Reduce Delays

Acknowledgements / sources

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What is it about?

Engaging clinicians and diagnosing the details of the challenge to reduce the number of follow up appointments in outpatients.

How will it help achieve 18 weeks?

Reducing the ratio of new to follow up appointments in outpatients was highlighted in the 10 High Impact Changes as having the potential to release capacity in outpatients. High Impact Change number 5: Avoiding unnecessary follow ups for patients and providing necessary follow ups in the right care setting could save half a million appointments in just orthopaedics, ENT, ophthalmology and dermatology nationally.

What was the problem?

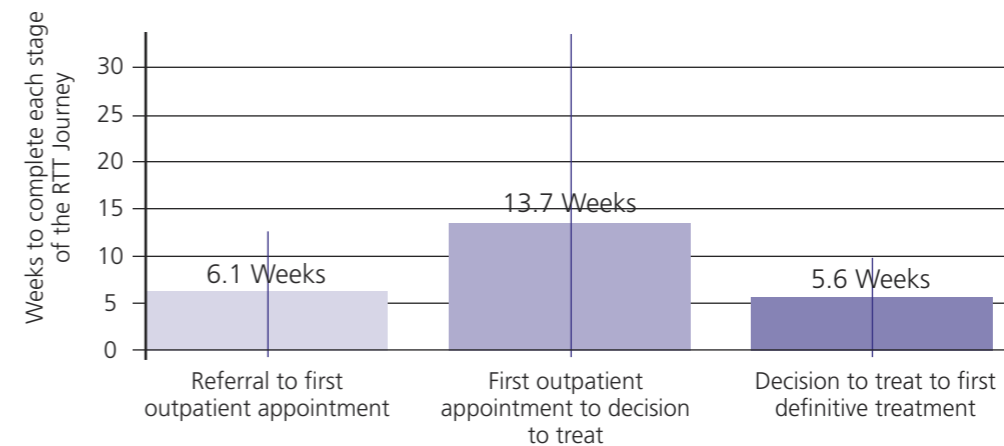
Heart of England NHS Foundation Trust is a phase two ambassador site for the No Delays Achiever website. The ENT Directorate was selected as one of the areas of focus for the project, which ran for 18 weeks from January 2008.

The general manager and clinical director for ENT already suspected that there was an issue with new to follow up ratios. They had decided that improvement work was needed to address the situation but were unsure where to start.

Following an initial diagnostic conversation with the general manager and clinical director, a high level project plan was devised that was designed to feed into a wider piece of work, which was already planned. The ENT team was due to go through the Trust's Lean Academy in six weeks time. The team was keen to develop a piece of work that would feed into the value stream investigation event at the start of their Lean experience; in essence, to act as a catalyst to raise awareness of the challenges faced and suggest potential solutions.

During the diagnostic conversation, it was clear that the team knew that this wasn't a new challenge; that several of the issues were already recognised and that they knew at a high level that ratios were inconsistent between sites.

To provide evidence to confirm the view that new to follow up ratios were an issue, two sources of data were used: the No Delays Achiever Patient Journey Analyser and the Hospital Information System. The Patient Journey Analyser shows that, in ENT for the period October to December 2007, referral to first outpatient appointment took 6.1 weeks and 13.7 weeks from first outpatient to decision to treat.

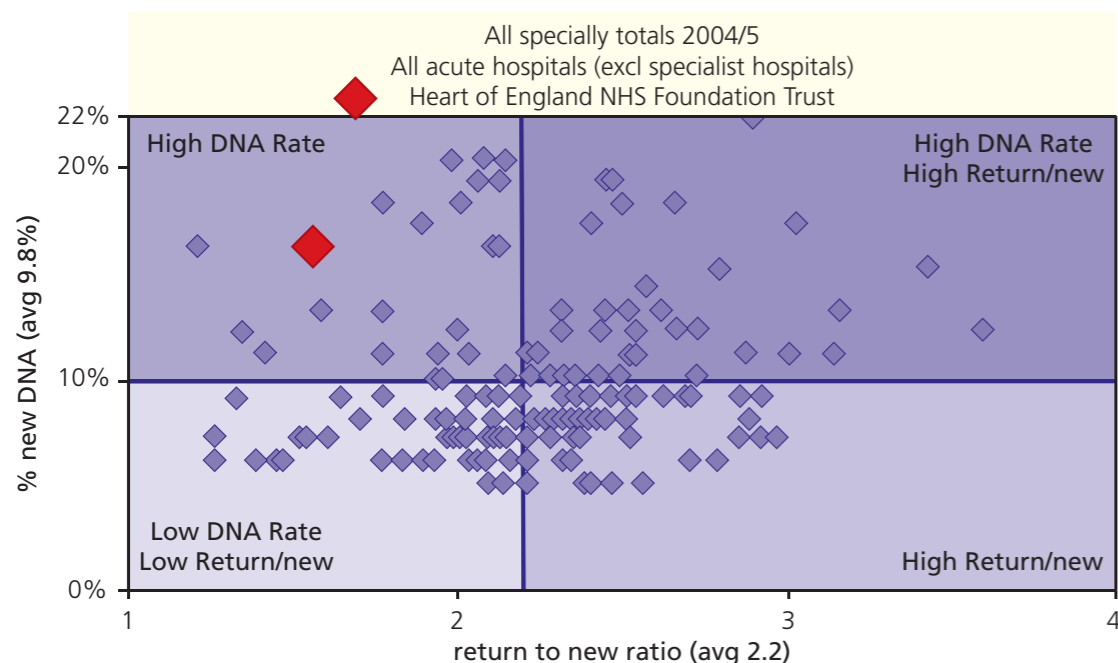


To understand the detail behind this data, the team used the Trust's information system to understand the number of patients waiting over 18 weeks. They then took a sample of these patients and carried out a detailed examination of their journeys. In addition, they put together data to show the new to follow up ratios broken down by consultant and location.

The team identified several issues as a result of this process, including:

- open clocks – they evaluated the reasons for clocks being open for patients with journeys longer than 18 weeks:
 - they identified that many clocks should have been stopped as first definitive treatment had already happened
 - 65 patients from Jan to end Feb who had waited over 18 weeks had been sent for diagnostic tests and then had to wait for a follow up appointment in outpatients
- significant variation between consultants in terms of new to follow up ratios.

Specialty	First	Follow Up	% New	% Follow Up
ENT	218	466	32%	68%
ENT	4,630	4,973	49%	51%
ENT	638	1,281	33%	67%
ENT	247	713	26%	74%
ENT	182	447	29%	71%
ENT	26	148	15%	85%
ENT	537	2,116	20%	80%
ENT	6	12	33%	67%
ENT	169	675	20%	80%
ENT	26	61	30%	70%
ENT	308	637	33%	67%
ENT	210	498	30%	70%



To understand whether the new to follow up ratios from their consultants were in line with other organisations nationally, the team used two sources of productivity information – the National Productivity website <http://www.drfoosterintelligence.co.uk/productivity/> which shows the national DNA and follow up rates for the organisation in comparison to other NHS trusts and from the NHS Institute's Delivering Quality and Value team. This showed the rates for all English NHS organisations delivering ENT services, nationally ranked for all trusts. In addition, they carried out some observation work in outpatient clinics on two hospital sites to gain an understanding of how the clinics run and what the issues were. This highlighted a number of issues, not only in relation to the new to follow up ratios:

- shared all this data with new to follow up ratios with the clinical director
- carried out observation work with two consultants
- made recommendations as a result of this
- fed into the value stream investigation event at the start of the ENT Lean week
- it acted as a catalyst for further investigation during the Lean week – cost of current new to follow up ratios – potential capacity released if the rate of follow ups were reduced to national average levels.

The new to follow up ratio was highly variable between consultants, resulting in reduced capacity in outpatient clinics.

What they did to identify the cause of the problem

- Used Patient Journey Analyser to identify how well the directorate was performing in terms of 18 weeks.
- Used local information system to establish new to follow up ratios broken down by consultant and location.
- Looked at nationally available productivity data.
- Observed outpatient clinics across the directorate.
- Talked to consultants, nursing and admin staff in ENT.

What they did to improve service

- Fed this information back to the directorate manager and clinical director.
- Used this information to feed into the ENT value stream investigation week in association with the Trust's Lean Academy.
- The clinical director added financial information to demonstrate the potential impact of achieving a consistent new to follow up rate.
- A summary of the information gathered was presented to the ENT Clinical Governance group who agreed that they needed to have an away day for clinicians to discuss:
 - variation between clinicians
 - potential clinical protocols
 - agreed clinical pathways
 - an agreed way forward.

What is it like now?

Clinicians have an increased awareness of their new to follow up ratios and the impact this has on ENT's capacity and the ability of the organisation to meet 18 weeks.

There is an agreed action plan with a clinical lead appointed to take this work forward.

Key points

- Early clinical engagement is extremely important when planning this type of work as recommended changes will impact the way that they work.
- Data is vital to illustrate the issues you face – this can be high level data as found on the Patient Journey analyser and Dr Foster Productivity sites or more detailed data from the organisation’s information system.
- Observation gives an insight into the way people really work.

Tips for implementation

- The No Delays Achiever is a useful tool to initiate conversations for service improvement.
- Allow time for observation and feeding the outcome of this back to the team.
- Using a combination of existing data plus future modelling helps to engage the team and shows the potential impact of making improvements.

Additional resources

<http://www.drfoosterintelligence.co.uk/productivity/>

Acknowledgements / sources

Jo Tolley, Service Transformation Lead, Heart of England NHS Foundation Trust
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Understanding Theatre Utilisation in Ophthalmology

What is it about?

The No Delays Achiever was the starting point for a service improvement project to improve theatre utilisation in ophthalmology by reducing cancelled operations.

How will it help achieve 18 weeks?

By reducing unnecessary cancellations, theatre capacity will be maximised and waiting times for operations reduced by using existing capacity more productively.

What was the problem?

The Patient Journey Analyser element of the No Delays Achiever highlighted ophthalmology as one of the University Hospitals Leicester (UHL) specialties at risk of not achieving the 18 week patient journey. In addition, the Trust was concerned about numbers of cancelled operations within the specialty. The theatre team felt the cancellation problem was out of their control – ‘we eat the dinner we are served’.

What they did to identify the cause of the problem

A two week audit of theatre utilisation was undertaken. This audit looked at theatre planned and actual start time and the number of cancellations per session, per theatre by reason for cancellation. This audit revealed 25 cancellations over the 2 week period.

Reason for Cancellation	Number of Cancellations
Moved to allow bigger operation	2
Cancelled to allow an emergency procedure	2
Appointment error	1
Medication not stopped	1
Operation already done	7
DNA	5
Patient needs GA instead of LA	1
Patient didn't want operation	1
Patient needs more tests	1
No beds	1
Patient unfit	2
Donor tissue unsuitable	1



What they did to improve service

Understanding the root cause of the cancellations on a session basis showed that most were avoidable. The team decided to undertake a waiting list validation exercise and look at how patients were removed from the list post surgery. They also decided to start appointment reminder phone calls the day before surgery, undertaken by the eye surgery ward staff.

The team are also piloting Lean green stream operating lists as per the Wirral Hospitals case study for the highly predictable procedures.

The team realised that they could control some of the problems.

What is it like now?

Improvements are just being implemented and a re-audit of cancellations will be undertaken to measure improvement. The audit has been taken to the hospitals' theatre utilisation group meeting to look at replicating the study across other surgical specialties. This team are also going to undertake development in applying Lean principles.

The learning from the study will also be shared with clinicians in January 2008 at a specific event for them to learn more about the No Delays Achiever.

The theatre utilisation group are sending a small team on a Lean skills learning event to assist their improvement work.

Key points

- Use data to inform your decision making.
- Even when you think you cannot control the situation you probably can.
- Monitor and communicate results.

Tips for implementation

- Do not make assumptions about the underlying causes of problems.
- Diagnose the causes which often have simple solutions for prevention.
- Involve all stakeholders.

Additional resources

The following tools provide further details about some of the steps described in this case study.

- Demand and Capacity - The Basic Concepts
- Demand and Capacity - A Comprehensive Guide
- Reducing Cancelled Operations
- Identifying Problems
- Waiting List Validation
- Glenday Sieve - Runners, Repeaters and Strangers
- Reducing DNAs

Acknowledgements / sources

Paula Higgins, Team Leader, Eye Theatres, University Hospitals Leicester
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What is it about?

Using 5s, the well known methodology with the added dimension of safety making it 6s, to create a work flow around the pharmacy aseptic unit distribution area in order to improve the service to customers, whilst improving the work area for staff.

How will it help achieve 18 weeks?

When new processes are implemented, 6s is a very important component to help create a systematic, safe, clean and orderly workplace and methods to keep it that way. Removing waste, enabling the work to flow, standardising and sustaining processes gives better efficiency and reduces rework, thereby increasing productivity - essential in reducing delay.

What was the problem?

Processes were inefficient: work did not flow and staff travelled long distances throughout the day. In addition, the environment was difficult and hazardous to work in - corridors were cluttered and difficult to move around, creating major health and safety implications.

What they did to identify the cause of the problem

A multi-disciplinary team was formed, comprising front line staff, managers and Lean team, in addition to staff from other departments and organisations to provide 'fresh eyes'. Then an event was held to examine the current processes for aseptically prepared products, to distinguish value and non-value adding steps and identify waste.

The team found that there was a small number of very complex products and a large number of less complex products and processes with waste and inefficiency; lots of travelling, inventory (batching / waiting). In addition, documentation and records were complex.

It was difficult to access lab results because of limited computer terminals.

This initial event impacted on other areas in the pharmacy department, namely the stores and distribution area, and so this informed the next Lean improvement event.

What they did to improve service

Applied 6s. In simple terms 6s is:

1. Sort – removing what is not needed
2. Straighten for flow – organise what is needed
3. Scrub – clean the area
4. Safety – identifying and preventing unsafe conditions
5. Standardise – establish who does what and when for the upkeep of the improved work area
6. Sustain – keeping up the standards.

The real key to the success of the 6s event was standardising – establishing roles and responsibilities for the upkeep of the improvements and more importantly, sustaining the improvements made.

The team also created a Lean cell (specialised area) for the production of Mini-bag Plus products, streamlined documentation and created a production control board.

What is it like now?

- Flow has now improved – distance travelled has reduced by up to 50 per cent in the palate area.
- Deliveries are easier – reduced time by 50 per cent.
- Clearer visual management with more working space.
- Individual staff needs catered for – workstation design.
- Work is supported by a production control board.

IMPACT OF MINI-BAG PLUS LEAN CELL:

	Before	After	% Change
Assembly steps	257	157	39% Ⓣ
Assembly stages	10	6	40% Ⓣ
Path lab access	4	6	50% Ⓣ
Chemo docs	5	1	80% Ⓣ

6s has also been applied in a number of office areas and wards across the hospital as it is one of the key disciplines when implementing Lean processes. Here are a few examples.

A&E resus

A 6s activity in the resus room ultimately increased patient safety through the improved layout of equipment, ensuring the same stock and layout as critical care and HDU, reducing patient transfer times and staff time wasted looking for items, as well as a reduction in stock duplication. A & E made pharmacy and stock savings of £2,535.59.

Pathology specimen reception

Through the 6s activity in pathology specimen reception, the following has been achieved:

- reduced stress, duplication and improve health and safety for staff
- reduced travel distance of specimens and staff working in the area through improving structure and organisation and reducing clutter
- implementation of visual management and working practice of specimens arriving in the area – standard work.

Trauma stabilisation unit

The 6s activity:

- reduced staff time looking for lost equipment – more time spent on value adding work, greater efficiency and reduced stress / frustration
- increased the appropriateness of stock items and levels
- created standard layout of all bed areas, equipment and stock areas
- created clear responsibilities and tasks to ensure improvements sustained
- introduced visual management and standard work.

By conducting the 6s activity, drugs returned to pharmacy amounted to approximately £1000, in addition to other stock items.

C2 nurses station and clerical office

The 6s event enabled:

- better work environment for staff / improved nursing station for patients and visitors
 - more organised, de-cluttered
 - less time spent looking for things – therefore more time spent on patient care
- 100 per cent appropriate and accurate documentation.

Key points

- We have learnt the importance of one piece flow.
- Lean events give you the benefit of time out to look at processes.
- 6s is really hard work – don't underestimate the time required or people needed when planning an event.

Tips for implementation

- Never seek perfection on the first attempt!
- The real key to the success of 6s event is standardising – establishing roles and responsibilities for the upkeep of the improvements and more importantly, sustaining the improvements made.

Additional resources

Introduction to Lean. Further Lean resources from the NHS Institute for Innovation for Innovation and Improvement.

Acknowledgements / sources

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