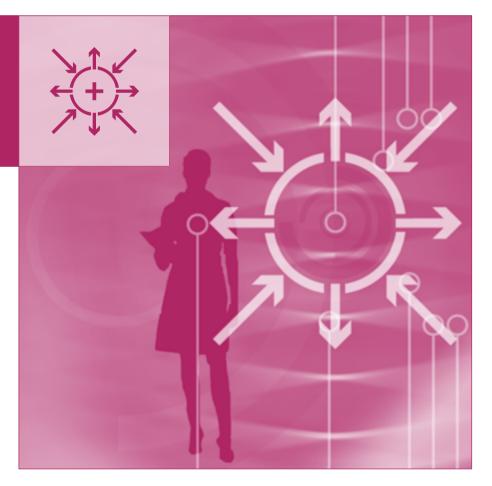**NHS**
Institute for Innovation and Improvement

Improvement Leaders' Guide
Process mapping, analysis and redesign
General improvement skills

Improvement Leaders' Guides

The ideas and advice in these Improvement Leaders' Guides will provide a foundation for all your improvement work:

- Improvement knowledge and skills
- Managing the human dimensions of change
- Building and nurturing an improvement culture
- Working with groups
- Evaluating improvement
- Leading improvement

These Improvement Leaders' Guides will give you the basic tools and techniques:

- Involving patients and carers
- ▶ **Process mapping, analysis and redesign**
- Measurement for improvement
- Matching capacity and demand

These Improvement Leaders' Guides build on the basic tools and techniques:

- Working in systems
- Redesigning roles
- Improving flow

You will find all these Improvement Leaders' Guides at
www.institute.nhs.uk/improvementguides

Every single person is enabled, encouraged and capable to work with others to improve their part of the service
Discipline of Improvement in Health and Social Care

Contents

Every system is perfectly designed to get the results it achieves

Don Berwick

1. Introduction

Process mapping is a simple exercise in your toolkit of improvement methods. It helps a team to know where to start making improvements that will have the biggest impact for patients and staff. The 'Model for Improvement' helps a team to set aims, targets and measures, and introduces a way of testing ideas before implementing them. So it's logical to consider the two together.

A simple framework for improvement

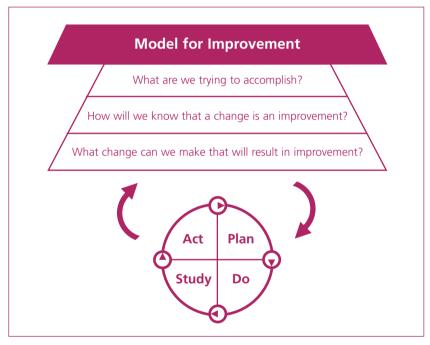|	
Step 1	Define the aim for the project including: • the group of patients you are considering • what you want to achieve - your own targets
Step 2	Consider how you are going to know if a change is an improvement: • what measures you are going to use • how you are going to report progress to all the interested parties
Step 3	Involve the staff in mapping and analysing the process: • really understand the problems for patients, their carers and the staff • start to measure and create the baselines for your improvements. You may need to revisit your targets at this point
Step 4	Investigate all the changes that are likely to make an improvement in line with the aims set: • talk to other healthcare services, organisations and the patients • look at the other Improvement Leaders' Guides
Step 5	Test out the change ideas to see if they actually do make improvements: • consider the knock on effects that making one change will have to that process and other parts of the system or different systems
Step 6	Implement the changes that will make improvements
Step 7	Congratulate the team and celebrate your success but continue to: • revise often to ensure the improvements are sustained and the new improved process is still fit for purpose • look for ways to continue to improve • offer help, advice and support to other improvement teams

Don't forget to plan the evaluation from the beginning.
Look at the Improvement Leaders' Guide: Evaluating improvement
www.institute.nhs.uk/improvementguides

2. Model for Improvement

2.1 Introduction to the Model for Improvement

The model for improvement was designed to provide a framework for developing, testing and implementing changes that lead to improvement. It attempts to temper the desire to take immediate action with the benefits of careful study. Its framework includes three key questions with a process for testing change ideas using Plan, Do, Study, Act (PDSA) cycles.

Reference: Langley G, Nolan K, Nolan T, Norman C, Provost L, (1996), The Improvement Guide: a practical approach to enhancing organisational performance, Jossey Bass Publishers, San Francisco.

2.2 What are we trying to accomplish?

You and your improvement team need to set clear and focused goals. These goals will require clinical leadership and should focus on problems that cause concern for patients and staff.

The aims statement should:
• be consistent with national and local targets, plans and frameworks
• be bold in its aspirations
• have clear numerical targets

2.3 How will we know if a change is an improvement?

If we make a change, this should affect the measures and demonstrate over time if the change has led to a sustainable improvement. The measures used within this model exist as tools for learning and to demonstrate improvement.

They should not be used to create 'league tables' of different services, because each team or service will have a different starting point, a different culture and a different target population. The Improvement Leaders' Guide: Measurement for improvement www.institute.nhs.uk/improvementguides gives valuable advice on what and how to measure and how to present the data to interested parties.

2.4 What changes can we make that will result in improvement?

The list of potential changes that improvement teams could make to improve care delivery is very long. However, evidence from scientific literature and from previous improvement initiatives point to a small number of potential changes that are most likely to result in improvement.

A number of tried and tested change ideas have proved successful for many of the national and regional improvement programmes. One of the best sources for change ideas are the 10 High Impact Changes for Service Improvement and Delivery. For more information go to www.institute.nhs.uk/highimpactchanges

An example of an aims statement for patients with cancer

Aim
To improve access, speed of diagnosis, speed of starting appropriate treatment and patient and carer experience for those with suspected or proven bowel cancer.

This will be achieved by:
- introducing booked admissions and appointments
  target – more than 95% of patients will have a booked appointment
- reducing time from GP referral to first definitive treatment
  target – less than 30 days
- ensuring patients are discussed by the multi-disciplinary team
  target – more than 80% of patients

Efforts and measurements will be concentrated on a defined group of patients at four key stages of care: GP referral, first specialist appointment, first diagnostic test and first definitive treatment.

2.5 Testing change ideas

Use of PDSA (Plan, Do, Study and Act) to test change ideas is a very different approach for many of us. It is explained later in more detail in Section 7.2. The process map itself will generate lots of ideas to test.

3. Understanding processes

We are involved in processes all the time both at work and home

A good definition of a process describes it as a series of connected steps or actions to achieve an outcome.

A process has the following characteristics:
- a starting point and an end point. This is the scope
- a defined group of users who will probably be a group of patients with similar characteristics or needs. This is sometimes called the slice
- a purpose or aim for the outcome
- rules governing the standard or quality of inputs throughout the process
- it is usually linked to other processes
- it can be simple and short, or complex and long

Patient processes in healthcare

Patient processes have often evolved over the years as changes have been grafted on to established working practices. There can be many different layers in addition to the patient process or journey. These include communication processes and administration or paperwork processes, and often involve a number of organisations or departments. It's no wonder that they are not always as effective as they should be.

Examples of different processes in healthcare:
- from first developing symptoms of a gastric ulcer to being discharged as fit
- from a referral letter being typed in the GP's surgery to the appointment letter arriving with the patient
- from the doctor saying that you need a chest x-ray to knowing the results

> **A clinical process** may be a short and simple sequence of actions by one person that are naturally performed together, such as taking someone's chest x-ray. Or it can be a complex set of activities involving many different people over time such as care for patients with heart disease.

Case study
Orthopaedic Service in the South East

When mapping the orthopaedic patient's journey, a team realised that many patients had to stay in hospital over the weekend waiting for physiotherapy. The team carried out a PDSA cycle to introduce weekend physiotherapy onto two orthopaedic wards over two weekends, and monitored the results. These showed that the length of stay reduced for patients involved in the test. A further test cycle was carried out over the next two weekends, when the service was withdrawn. This was to make sure that it was the service change, and not other external factors, that caused the improvement. Results of this second test showed that the length of stay increased for those patients not receiving the weekend physiotherapy service. The weekend physiotherapy service has now been introduced for two orthopaedic wards.

4. Benefits of process mapping

Process mapping is a really simple exercise. It is one of the most powerful ways for multi-disciplinary teams to understand the real problems from the patient's perspective, and to identify opportunities for improvement. After all, the only person who experiences the whole journey is the patient. Process mapping helps us appreciate how this feels and a team can then make decisions based on fact and understanding rather than their perceptions of how the service works.

A map of the patient's journey will give you:
- a key starting-point to any improvement project, large or small, which is tailored to suit your own organisation or individual style
- the opportunity to bring together multi-disciplinary teams from primary, secondary, tertiary and social care of all roles and professions and to create a culture of ownership, responsibility and accountability
- an overview of the complete process, helping staff to understand, often for the first time, how complicated the system can be for patients. For example, how many times the patient has to wait (often unnecessarily), how many visits they make to hospital and how many different people they meet
- an aid to help plan effectively where to test ideas for improvements that are likely to have the most impact on the improvement aims
- brilliant ideas, especially from staff who don't normally have the opportunity to contribute to service organisation, but who really know how things work
- an event that is interactive, that gets people involved and talking
- an end product, a process map which is easy to understand and highly visual

Process mapping is also easy, creative and fun.

Case study
Orthopaedic Service in the South West

The Trust opted to map the whole patient journey, from referral to discharge from the orthopaedic service. It took time but gave a clear idea of some of the key issues and frustrations. They had not realised how many hoops the patient had to jump through in order to get from beginning to end. The team found the map an invaluable source of reference for their improvement work from the beginning. They realised they had to carefully prioritise the changes to be made. They focused on the 'achievable' and were able to make significant improvements as a consequence.

5. Mapping a patient's journey

5.1 Getting started

Ideally you should have the support of key people willing to take on the following roles:

Sponsors
These are senior leaders in your organisation or service who:
- sanction the mapping event and the resulting changes
- make links between the service, the organisation and the health community
- align the key stakeholders in the service and beyond
- obtain and mobilise participation
- handle any 'power' issues
- convey support in one to one and small group meetings
- talk to those who have concerns
- create an environment that allows change to happen
- devote time, attention, energy and action to the cause

Project Leaders / Change Agents
These are respected clinical or managerial staff who:
- facilitate the change
- help those who deliver the service to improve it
- provide support and expertise
- plan the process mapping event
- build relationships
- ensure agreed actions are implemented or followed up
- ensure deadlines are met
- maintain momentum
- ensure effective communication to all

Champions
These are respected clinical leaders who:
- believe in the improvement project and demonstrate that support in public
- are willing to test out new ideas
- reach out to colleagues who do not support a change and try to influence them
- contribute expertise and experience

> **Have a go**
> Try it out with your team. You will be surprised at what you find out

5.2 Organising an event to map the patient journey

As an Improvement Leader, you will find you need to devote time, effort and energy to all stages of organising the event. Developing and maintaining good relationships will be crucial.

Preparation
- identify the patient group(s) whose care would benefit most by redesign. Consider groups of patients who:
  - share common characteristics
  - who present in a relatively high volume
  - whose appearance in any day, week or month is highly predictable
  - whose care could be standardised based on good evidence
  - whose care could be relatively fast if we took out all the waits and delays in the system
  - whose care could be mainly pre-scheduled
- define the objectives, scope and focus of the process mapping workshop. Don't try to do too much, it always takes longer than you think as there will be lots of discussion
- meet with clinical, managerial and service leaders beforehand so that they feel involved in the process
- identify the staff groups that are involved in the relevant stage of patient care. Ideally invite 15-25 representatives to map the patient journey. Any more than this number can be difficult to manage as you want everyone to feel involved at all times
- organise the event for one full day, or for two half-days no more than two weeks apart. This will, of course, depend on the length of the process you want to map and how complex it is. Make sure you have allocated enough time for what you want to do
- arrange a suitable venue, preferably off-site, as this provides a neutral setting and prevents participants dipping in and out
  - check the venue is a suitable size with good facilities and food
  - give participants at least a month's notice of the event. If you want medical staff to come, you will need to recognise local policies for cancellation and leave
  - invite participants, explaining their roles and outline your expectations of what the event should achieve. Emphasise the contribution each participant is expected to make

Running the event
- allow at least an hour for setting up before participants arrive
- get the lead clinician or the senior manager to attend and preferably to chair or open the event
- an independent facilitator is really useful as it allows you to participate more fully in the mapping exercise. It also ensures that there is someone who is removed from the process who can ask the more challenging questions without risking a breakdown in working relationships. You might ask someone who is a colleague from another department or different organisation
- you need to create an environment which people find safe in order to encourage honesty

Other resources needed
- a roll of brown paper or wallpaper to record the map on
- lots of Post-it notes in several colours
- flip charts and coloured marker pens

The event will generate lots of comments, thoughts and ideas. You don't want to lose anything so have an extra pair of hands ready to help by recording them on separate flip charts: issues and ideas 'car parks'. This will allow you to focus on the job in hand – mapping and analysing the patient journey, our advice is:
- not to be tempted to try and solve the problems until you have fully mapped the process and analysed it. Only then will you and the team be able to think of the ideas for improvement that you may want to test
- make the event practical, visual and fun. Most people like sweets and they help lighten the atmosphere and get people talking

Agree the next steps before the event finishes so that people can see the purpose of the event and know that their time has been used well. It could include:
- which parts of the process need to be mapped in more detail and how this should be arranged
- who should communicate with the people who have not been able to be at the event
- when and how you are going to generate ideas to test once the process is fully understood

Key messages for participants
- it's not rocket science
- processes are all around us, but in healthcare our roles limit us to seeing only one small part of the whole patient process
- it's not about blaming or criticising anyone or any department
- it's only the starting point and will lead to lots of other improvement tools and techniques
- it's fun

Taking it forward
- once a group has mapped the patient journey, check it out with others who were not able to attend the event. Perhaps display it for sometime in the staff room for comment. This should help people feel involved, gain commitment and encourage comments from shift and part time workers and others who were not able to be there
- it's a good idea to take photographs to illustrate the main steps and make a large, portable photo-board showing the patient journey. This could be done before the event as preparation
- send a copy of the notes and agreed next steps to each participant as well as to those who couldn't attend
- meet with the service leader and the lead clinician to agree what will happen next, such as finalising the plan for next steps and actions
- at a later date consider mapping the information given to patients and carers:
  - who gives information and at what stage?
  - what does the information say? are there any duplications or contradictions?
  - are there stages in the patient journey when there is no information available?
- don't forget to celebrate successes
- you will need to review the agreed actions with the participants at regular intervals to assess progress, capture learning and address problems

There is a lot more useful advice in running this type of event in the Improvement Leaders' Guide: Working with groups
www.institute.nhs.uk/improvementguides

5.3 Tips for process mapping

Supporting the participants

It's always useful before you start to agree some ground rules with the group. These might include:
- respect the diversity of the group and any differences in opinion
- use the five minute rule: if the group cannot agree what happens in five minutes, park the issue and follow it up after the session

Emphasise that process mapping is about trying to really understand the patient's experience at the various stages of their journey and there is no blame attached.

Mapping the journey
- define and agree the group of patients to be mapped
- define and agree the scope – that is, the first and last step of the process to be mapped but be careful not to limit the process unnecessarily
- identify all staff groups involved within the scope of this part of the process
- map that stage of the patient journey
- record on Post-it notes or draw on flip charts 'who does what to the patient'
- only write one step on each Post-it-note
- there are bound to be variations, so record what happens 80% of the time
- add 'guestimates' of time for each step and between each step

Concentrate initially on what happens to the patient. Don't get side-tracked by what happens to a referral form or request card. In the process described below the stage between patient step 2 and step 4 is an administration process and may cause the patient a long wait. These are parallel processes, which you may need to map separately in detail. (see section 6)

Example: a short part of a patient's journey
1 Doctor tells patient they need an x-ray examination
  • Doctor fills in a request form
2 Doctor tells patient appointment will come in the post
3 Patient goes home to wait
4 Postman delivers appointment letter
5 Patient goes to hospital
6 Receptionist receives patient and checks details

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6. Analysing a patient's journey

Having mapped the patient journey, get the team to analyse it by considering the following questions:

- how many steps are there for the patient? This is often a real revelation to staff
- how many times is the patient passed from one person to another (hand-off)?
- what is the approximate time taken for each step (task time)?
- what is the approximate time between each step (wait time)?
- what is the approximate time between the first and the last step?
- when does the patient join a queue or is put on a waiting list?
- do these delays occur on a regular basis?
- how many steps add no value for the patient? Imagine that you, or your parent or child, is the patient. What steps add nothing to the care being received?
- where are there problems for patients? What do patients complain about?
- where are there problems for staff?

Ask
- is the patient getting the most appropriate care?
- is the most appropriate person giving the care?
- is the care being given at the most appropriate time?
- is the care being given in the ideal place?

Tip
Use different coloured post-it-notes to differentiate the process (yellow) from problems or issues (pink) and solutions or ideas (green). This will help to keep the focus on the current process whilst capturing all the comments

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Case study
Department of Psychological Medicine in the Midlands

The Department of Psychological Medicine is a key point of access to mental health. A team from the department, primary care, local acute hospitals and mental health services got together to map the patient's pathway and the administrative process. They are using the understanding to develop a referral protocol and an electronic referral form for the department as well as for access to other mental health services.

When you map your process don't be surprised to find:

- a lot of the work that is done really does not add any value to the patient. Think of the amount of time spent looking for lost paperwork and equipment, waiting for something to happen and apologising if things don't go according to plan
- most of the errors, duplication and delays happen when the patient or the paper work is handed from one person, department or organisation to another. This is often called a 'handoff'

At the steps where there are the longest delays keep asking 'why' to try to discover the real reason for the delay. For example, if your starting point is 'the clinic always overruns and patients have to wait for a long time' ask 'why'. Possible response: 'because the consultant does not have time to see all his patients in clinic.' Why? Possible response: 'because he has to see everyone who attends (including first visit assessments and follow-up patients).' Why? Possible response: 'because that is what he has always done' – and so on. In this case, for example, the change might be to increase the nurse specialists' responsibilities so that they see routine follow-up patients, freeing up the consultant to spend more time with new referrals or ask if a follow-up visit by the patient is really needed at all.

Case study
Mental Health Service in London

A Mental Health Trust in London and the Community Mental Health Trusts realised there were problems with access to outpatient clinics, which were being described as a 'lottery system'. The team used process mapping to really understand how new patients were referred, where they had to wait and what the patient experienced. The team soon realised that there were high non-attendance rates, lengthy waiting lists, misuse of consultant resources and a high potential for gaps in communication.

Also

- estimate the number of queues (groups of people waiting) and the amount of time and effort required to manage those queues
- look to see if administration work or patients are 'batched'. This is when the work accumulates for hours, or even days, before it is considered to be enough to attend to. For example, reporting a whole week's x-rays in one go, or allocating appointments for a whole week's referral letters at one time, rather than dealing with them as they come in

- look to see if the 'expert is doing what they should be doing', or whether they have to do other things that take up their time. 'Experts' include all staff with expertise including medical, nursing, administration and technical staff
- map in more detail those parts of the process where there are particular waits and delays for patients. These are often the parallel processes for tests or administration
- validate your 'guestimates' by actually measuring the relevant times and numbers to be sure of your facts and figures

Make sure you understand the views and experiences of those who use the service. Perhaps try shadowing a real patient as they go through the process (with their consent of course!) and build this into the process map. There is lots of really useful advice in the Improvement Leaders' Guide: Involving patients and carers www.institute.nhs.uk/improvementguides

Case study
GP's surgery in Northern England

The surgery had six partners, each with three different appointment types: urgent, soon and non-urgent. With two surgeries per day, this meant there were up to 36 different queues to manage each day and 180 queues to manage from Monday to Friday.
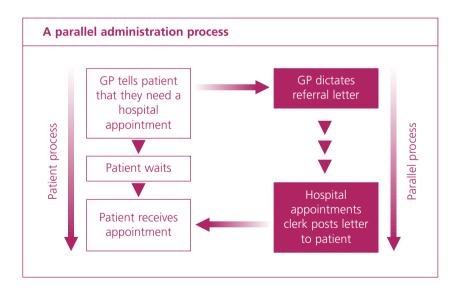
Interdependent processes

All processes are interdependent, meaning that the last process step, outcome or product of one process starts another. For example getting the results of a diagnostic test may be the last step in the diagnosing process but the first step in the admissions process or discharge process. Each smaller process usually feeds into another process and often is part of one or more larger processes. The patient flows through a series of processes in the patient pathway. For more information about flow look at the Improvement Leaders' Guide: Improving flow www.institute.nhs.uk/improvementguides

Parallel processes

These are really important and often are the cause of delays for patients and frustration for staff. Mapping, analysing and improving parallel processes will often deliver great benefits. Parallel processes include:

- processes involved in generating a referral letter and in getting the appointment details to the patient
- processes involved in dealing with pathology specimens: from the time the specimen is taken to the point when the requesting clinician receives the test results
- processes involved in imaging reporting: from the image being requested to the image and the report being received by the referring clinician
- processes involved in medical records: from getting the notes to returning them to 'file'
- processes involved in communicating by letter: from deciding the need for a letter to the letter being received by the designated person

A parallel administration process

Tip
Remember process mapping is only one method open to you.
Use it in conjunction with other relevant tools.

Activity and role lane mapping

For the parts of the process that are causing problems, consider activity and role 'lane mapping'. To do this, take the role out of the activity so that

nurse records vital signs

becomes

record vital signs

List the process activities and the roles involved and ask 'who does this now?' as in the diagram below.

This could be followed by discussion around who could do each activity if it were redesigned.

Activity and role lane mapping
 – current situation in an outpatient clinic

Activity/role	clerk	nurse	porter	doctor
Move patient		x	x	
Record details	x		x	
Record vital signs		x		x
Take history		x		x
Examine patient				x
Write pathology request				x
Write imaging request				x

7. Redesigning a patient's journey

Always focus on the patient when considering what changes to test. Avoid processes arranged around the needs of staff, departments or organisations at the expense of patient care and experience.

7.1 Change ideas

Co-ordinate the patient process of care
- establish formal links between primary and secondary care teams to manage the transition from inpatient to outpatient as effectively and easily as possible
- create opportunities for staff across the wider process of care to meet, share problems and develop integrated objectives
- fax or email orders and clinical information between care settings
- reduce the number of hand-offs. Each time there is a hand-off there is potential for delay, duplication of work and errors
- reduce the number of steps in the process, particularly those that do not add value

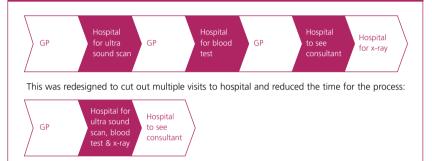**Pre-plan and pre-schedule care at times to suit the patient**
- co-ordinate the scheduling of appointments for patients with multiple providers. For example, if a patient needs multiple tests, book the test with the longest wait for results first. This way all the results are given at the same time
- provide the patient with a comprehensive care plan with booked, convenient times for future care
- create a trigger system so that booking a diagnostic test triggers a future appointment

Reduce the number of times a patient has to travel to visit the hospital or surgery
- reduce the number of follow-up appointments for patients, freeing up clinic slots to see new referrals
- ask if the patient really needs to return to clinic to see a consultant? If not, can the follow-up be done by someone else in another location, for example, by the GP or community nurse?
- consider introducing open follow-up appointments where the patient requests a follow-up only if indicated by the progress of their condition
- are there procedures that could be done in the same visit?
- can clinics be held in parallel?
- could the patient have several investigations at the same visit?
- could patients complete a symptom or information form at home before attending a clinic?

Case study
Ovarian Cancer Service in London

When the team got together with staff to map the patient's journey for patients with suspected ovarian cancer, they realised how many times the patient had to go between the GP and the hospital before they were diagnosed and how long it took.

| GP | Hospital for ultra sound scan | GP | Hospital for blood test | GP | Hospital to see consultant | Hospital for x-ray |

This was redesigned to cut out multiple visits to hospital and reduced the time for the process:

| GP | Hospital for ultra sound scan, blood test & x-ray | Hospital to see consultant |

- could patients carry their own records? This would mean they wouldn't have to fill in the same information several times
- could the care be carried out nearer to the patient's home, or at a place of the patient's choice?

Reduce or eliminate batching
- do work when it arrives, rather than waiting to deal with a whole set of similar tasks at the same time

Reduce the number of queues to be managed
- 'pool' the lists or queues into just one list instead of having multiple queues to manage (personalised team referrals). Just like the post office with one queue to multiple experts

Extend staff roles
- encourage staff flexibility in the roles they undertake and the hours they work
- nurse or radiographer-led clinics can reduce delays and improve the patient experience

Again, do not forget to add to all the information and ideas from your process mapping event, the views and experience of those who use the service.

Case study
Endoscopy Service in the West Midlands

The team started with long and variable waits for patients and the realisation that they were a key bottleneck in the journey for cancer patients. The team mapped the patient's endoscopy journey to understand where the problem areas were, and created what they wanted the ideal patient's journey to be.

By doing this, staff became more aware of the problems patients experienced and were more willing to change. Among other things, they found that they were managing more than 73 queues. So the whole booking process was redesigned, booking rules agreed and booked appointments started. This has enabled demand and capacity to be measured, thus helping with further redesign ideas.

7.2 Testing the change ideas

Use of Plan, Do, Study, Act (PDSA) cycles as part of the Model for Improvement (section 2) is a way of testing an idea by putting a change into effect on a temporary basis and learning from its potential impact. This is quite different from the approach traditionally used in healthcare settings, where new ideas are often introduced without sufficient testing.

There are four stages to a PDSA cycle:
- **Plan:** agree the change to be tested or implemented
- **Do:** carry out the test or change and measure the impact
- **Study:** study data before and after the change and reflect on what was learnt
- **Act:** plan the next change cycle or plan implementation

A PDSA cycle involves testing the improvement ideas on a small scale before introducing the change. By building on the learning from the test cycles in a structured and incremental way, a new idea can be implemented with greater chance of success. We have found that reluctance to change is often reduced when many different people are involved in trying something out on a small scale before implementation.

The PDSA cycle to test a change idea

- what changes are to be made to the next cycle?
- can the change be implemented?

- complete the analysis of the data
- compare data to predictions
- summarise what was learned

Act **Plan**

Study **Do**

- set objectives
- ask questions
- make predictions
- plan to answer the questions (who, where, when)
- plan to collect data to answer questions

- carry out the plan
- collect the data
- begin analysis of the data

The PDSA cycle

So why test a change before implementing it?
- less time, money and risk are involved
- the process is a powerful tool for learning. As much is learned from ideas that do not work as from those that do
- it is safer and less disruptive for patients and staff
- where people have been involved in testing and developing the ideas, there is often less resistance on implementation

How to test

- plan multiple cycles to test. Ideas can be adapted from other services, meaning that there is already evidence that the change works
- test on a really small scale. Start with one patient or with one clinician for one afternoon and then increase the numbers involved as the ideas are refined
- test the proposed change with volunteers, people who believe in the improvement that is proposed. Do not try to convert people to accepting the change at this stage
- only implement the idea when you are confident you have considered and tested all the possible ways of achieving the change

Remember that the PDSA cycle is part of the Model for Improvement and supports the three vital questions
- what are we trying to achieve?
- how will we know a change is an improvement?
- what changes can we make that will result in the improvements we seek. See section 2

"In previous roles I had introduced change using a 'big bang' approach where a huge amount of time and effort had gone into the planning stage and then a date was set for its introduction. This was often on a Monday morning. While this caused much excitement at the time, we never quite got things right and there were usually some people who had been fine about the idea but hated the new process once it had been introduced because they found it did not work for them as well as expected.

Using the Plan, Do, Study, Act cycles has been like a breath of fresh air. I have found that it is much easier to convince staff to try out the change in a small way and then reflect on it and refine it as needed. They felt much more involved and therefore feel some ownership of the new process and I have found that this improves sustainability because the staff have themselves invested in it and agreed the change."
Project Manager, South of England.

"PDSAs really help our team understand the impact a change would have and trying it out gave us the confidence that we were heading in the right direction".
Improvement team member

"PDSAs can prove that the change is a good one and that it is worth spreading across the whole service. Equally they showed when an idea didn't work and a new approach needed to be considered".
Improvement team member

7.3 Next steps

Don't forget to follow up

Do not underestimate the things to be actively followed up:

- you may need to measure the actual times and numbers in queues for good baseline data. Who will collect the data? How will you feed it back to the group?
- do you need to validate what was discussed and the resulting process map with others who were not at the session? How will you get their input?
- who agreed to do what in the session? How will you ensure these actions actually happen?
- do you want to organise a patient group to test the process on users of the service to make sure you have their thoughts, experiences and ideas?

Working to reduce delays the bottlenecks

In our experience process mapping is the vital starting point for redesign and improvement. Mapping a process shows where the bottlenecks are: where patients or paperwork are held up in queues. It is the work to match capacity and demand and reduce variation particularly at the bottlenecks that has led to some of the most exciting improvements in a healthcare process.

The Improvement Leader's Guide: Matching capacity and demand www.institute.nhs.uk/improvementguides explains the most effective ways to measure and understand the capacity and demand at bottlenecks that often causes patients to wait. The Improvement Leaders' Guide: Improving flow www.institute.nhs.uk/improvementguides takes this to the next stage by giving advice on how to measure and understand variation in capacity, and variation in demand. Variation has been found to be one of the main causes of delays for patients, interrupting their 'flow' between departments and organisations. By managing and reducing variation, delays are reduced and 'flow' dramatically improved.

8. Activities

Before organising any activity, consider the following:
- who is the audience?
- what is their prior knowledge?
- is the location and timing of the activity correct?
- recognise and value that participants will want to work and learn in different ways. Try to provide information and activities to suit all learning preferences

Why is this important?
Some of us take to the idea of change more easily than others. Some like to develop ideas through activities and discussions, while others prefer to have time to think by themselves. We are all different and need to be valued for our differences. The Improvement Leaders' Guide: Managing the human dimensions of change www.institute.nhs.uk/improvementguides gives ideas of how to ensure the best possible outcome when working with different people.

8.1 Building a tower

Objective
- to encourage lateral thinking

Benefits
- can be used as an ice breaker

Time required
- five minutes maximum

Preparation
- participants to work in teams of five
- each team has a pack of cards and an area with a flat surface
- facilitator to be judge

Instructions to participants
- you have two minutes to build the tallest tower

Learning points
- look and encourage lateral thinking – for example, cards on top of door or on head of tallest participant
- encourage lateral thinking when considering ways to overcome problems that are identified

8.2 Customer needs

Objective
• to help participants think about quality and process

Benefits
• very easy to do

Time required
• ten minutes

Preparation
• resources: flip chart paper and pens

Instructions to participants
• think about what we as customers want at a supermarket
• participants discuss in small groups and collect their ideas on a flip chart
• facilitator summarises findings of whole group

Learning points
The elements of any good service are similar to what patients want from healthcare. Points that come out usually include:
• process: no wait, no crowds, convenient opening hours etc
• facilities: well laid out, good signposting, extras, e.g. café
• staff: courteous, knowledgeable, available
• technology: internet access
• quality: value for money, good quality products

8.3 Mapping an everyday process

Objective
- to help participants understand the elements of a basic process in an everyday setting

Benefits
- easy to do
- good introduction to concept of process thinking

Time required
- ten minutes, with ten minutes for discussion

Preparation
- participants: work in small groups, preferably on round tables in cabaret style
- resources: flip chart paper, pens and Post-it notes

Instructions to participants
- think about and map the process of going to work in the morning
- where does the process start and where does it end?
- what are the main process steps?

Analyse by considering the following
- what are the outcomes?
- what are the quality standards?
- do any steps run in parallel?
- where are the bottlenecks and how do you manage them?

Learning points
- identifying process steps
- recognising that processes, bottlenecks and parallel processes are familiar concepts
- understanding and relating everyday bottleneck management with healthcare
- process mapping is easy, fun and anyone can do it

Variations
- any process common to all participants can be mapped, for example making a breakfast of tea, toast and a boiled egg to show how multiple processes have to be worked in parallel

8.4 Mapping a healthcare process

Objective
• to give participants an opportunity to experience mapping and analysing a healthcare process

Benefits
• demonstrates key points when training facilitators to lead process mapping with their own teams

Time required
• defining and mapping the process: 60 minutes
• process analysis: 45 minutes

Preparation
• participants: small groups, preferably working in teams, who have some knowledge of a common care pathway, in their own breakout room
• resources: lots of Post-it notes, brown paper or wall paper, marker pens

Instructions to participants to
• think about their common process and agree start and end points and outputs
• map the key process steps of the patient journey
• encourage teams to view each other's maps and ask questions

Analyse by identifying
• number of steps in process
• number of steps that do not add value to the patient
• steps where patients have to wait

Redesign by considering
• changes they would like to test
• encourage teams to share possible changes and consider if these could be adapted for their own process

Learning points
• that process mapping is easy and fun
• how much there is to understand about what really happens to patients
• a good activity for you and your team to start with

9. Frequently asked questions

Question

How can we make sure that we involve patients and their carers?

Answer

This is so important that there is an Improvement Leaders' Guide dedicated to involving patients and carers www.institute.nhs.uk/improvementguides. Everything we do should be focused on patients and their carers. They must be involved in all our improvement work from the very beginning. We are able to offer advice based on current thinking and experience of how to involve patients and carers in the most effective way, with warnings of possible pitfalls.

Question

How do I persuade colleagues of the value of spending more than an hour mapping the service?

Answer

Explain that this is the best way to start making improvements and perhaps refer them to other services or colleagues who have done it. Stress the importance of understanding their contribution to the work of the service. Also consider if the team is ready for change and whether the problem with arranging a meeting is really a reluctance to be involved. In which case engage your change agents, champions and sponsors – perhaps a letter from the Chief Executive may help. Understand also that some of us take to the idea of change more easily than others. Some like to develop ideas though activities and discussions, while others prefer to have time to think by themselves. We are all different and need to be valued for our differences. The Improvement Leaders' Guide: Human dimensions of change will give you ideas of how to ensure the best possible outcome when working with different people. www.institute.nhs.uk/improvementguides

The best part has been mapping the patients journey. I thought I knew what happened to the patient, but I didn't. It only took two afternoons, it was practical and good fun.

Consultant Surgeon

Question
What happens if you cannot get everyone together at the same time?

Answer
Consider any of the following variations on process mapping
- mapping can take place with very small groups or even getting one or two people to walk through and record the patient's journey. Then take it to other small groups or individuals for their comments
- issuing the instructions of how to map and setting up the blank "map" in a place where people go to have their coffee breaks. Encourage them to keep adding to the map over a two-week period and then produce a tidied up version for final amendments
- organise a process mapping day, inviting all relevant staff to 'drop in' at any point within a given timeframe. Cakes and chocolate are always a powerful way to draw people

Question
Where do you start when you know that you need to look at the whole patient process, from the patient's visit to the GP to the time they are discharged as fit?

Answer
You may want to do a very high level process map with a small group of stakeholders to establish where there is the greatest potential for improvement. Then focus on those stages in the process in more detail.

Question
Why do you suggest using Post-it notes and paper, when there are some excellent computer programmes around?
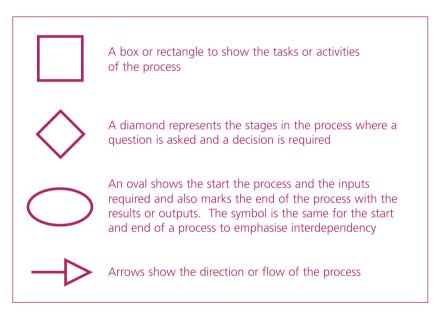
Answer
One of the main objectives of process mapping is getting people around a table talking to each other and understanding each other's problems. The excellent software available could be really useful when everyone agrees on the process map. It allows you to organise the information from the Post-it notes into a more manageable format. Then the electronic version of the process map can be shared on the web or by email and so can broaden the potential audience for comments and suggestions.

Question

What is a flow chart and how is it different to a process map?

Answer

They are both basically the same with the emphasis on understanding the flow or sequence of events but a flow chart takes it further by using conventional symbols to represent different activities. The main symbols are shown below

A box or rectangle to show the tasks or activities of the process

A diamond represents the stages in the process where a question is asked and a decision is required

An oval shows the start the process and the inputs required and also marks the end of the process with the results or outputs. The symbol is the same for the start and end of a process to emphasise interdependency

Arrows show the direction or flow of the process

Our advice to you would be to start simply and use whatever style is right for you and those you are working with. Don't get too hung up on the technical side. Getting people around a table talking is a really important first step.

Question

How can you separate out the parallel processes from patient processes?

Answer

The two best and easiest ways are to
- make them look different by using a different colour
- map the parallel process alongside, but separate from the patient process

Question

What other kinds of processes can I map?

Answer

Any processes (parallel processes) that cause problems to patients, their carers or staff can be mapped, including:

- administration processes e.g. referral
- diagnostic processes e.g. imaging, pathology
- communications processes between primary and secondary care
- supporting services e.g. catering, ambulance

Question

I heard someone say something about 'value stream mapping' in relation to processes. What is it?

Answer

The term 'value stream' is one of the tools of 'lean thinking' and takes process mapping to the next stage. For healthcare don't just think about the process a patient takes through the different organisations and departments, but also all processes required to ensure the supply of all necessary materials e.g. drugs are at the right place at the right time with the flow of information that supports both patients and materials. It's a bit like parallel processes (section 6) but it makes you think carefully about the value each of the additional processes add to the patient. Thinking in this way will help you understand how there are many 'value streams' necessary for the patient process.

Question

How do I handle the process mapping meeting?

Answer

It is always helpful to engage one or two other colleagues who have experience of process mapping. One can be helping the team to map and the other can be noting any ideas or issues that are bound to come up during the event. This will help to give you confidence. But you will find that, with the right preparation, this will be a meeting to which people really want to contribute.

Question

I have heard of something called the 80:20 rule. What is it and how is it useful in improvement?

Answer

This is called the Pareto Principle and describes the 80:20 relationship of cause and effect, efforts and rewards, inputs and outputs.

It is a way to focus your improvement efforts:

- look at any complaints about your service. The Pareto principle predicts that most of the complaints (80%) will be for a few causes (20%). So that is probably the place to start
- look at the types of requests a department receives e.g. pathology and radiology. The Pareto principle predicts that most of the requests (80%) will be for relatively few of all the examinations or tests the department offers (20%). Again, showing you where you might start and have the most impact

So the 80:20 rule, or Pareto principle, will help you and your improvement team focus on the areas that will have the biggest impact when improved

Question

Can you suggest an agenda for a process-mapping workshop?

Answer

A good agenda might include:

- introductions
- agreeing the aims for the day
- setting the scene – short presentations of background information or progress so far
- mapping the current process
- feedback, discuss and agree that the process map is correct
- analysing the process
- identifying what is done well and what could be done better
- feedback and look for opportunities to make improvements
- introducing the idea of PDSA and how to test ideas for improvement
- actions and further work: who, what, where, when, etc

Remember that you may need to split the participants into groups, depending on the scope of the process and the number of participants

Question

I keep hearing a lot about systems. Where do processes fit in?

Answer

Processes are one of the component parts of a system. The important thing to think about when you are working to improve your process is the impact on other parts of the system because if you do things differently in your work area or department it will have an impact on other departments and services. There is a lot more about this in the Improvement Leaders' Guide: Working in systems www.institute.nhs.uk/improvementguides

Question

How will all this really help us?

Answer

The combination of Process mapping and analysis, Measurement for improvement, Matching capacity and demand and Improving flow www.institute.nhs.uk/improvementguides will really begin to make improvements for patients. Showing improvement is a great boost for the team and gets other people interested. It will also help to show other areas for improvement and provide support in business cases for extra resources, as you can show that all other options have been considered and tested.

Question

What happens if I don't get it right first time?

Answer

It depends on what you think went wrong and why. The main thing is to learn from your experiences and not to give up

Use the model for improvement and PDSA cycles on yourself in relation to process mapping. If you did not feel you 'got it right', you obviously had some sorts of measures. So before you do it again think about what aspects you want to improve then plan it, do it, take time to reflect and study and learn for the following time.

A few words to end

Whilst you may not have everything right from the outset, you will make quicker progress in mapping and analysing a patient's journey if there is a willingness and commitment to:

- making real improvements in your service
- describing your service honestly, warts and all
- sharing your conclusions with everyone involved in delivering that service, including your patients and their carers
- allowing the enthusiasts to get on and test out the good ideas that will come out of process mapping

Process mapping will give you
- a living document that shows the current patient care pathway and some great ideas from colleagues, patients and carers about changes that will make a real difference
- a natural pathway into some of the other tools and techniques that have been shown to be invaluable when making service improvements
- an improved service which both enhances your relationship with patients and the quality of the working life for staff in that service

10. Glossary of terms

Some of the words used in improvement have been defined.
Use them carefully.

Activity	All the work done. This does not necessarily reflect capacity or demand as the activity in June may well include demand carried over from May, April, or even March
Backlog	Previous demand that has not yet been dealt with, showing itself as a queue or a waiting list
Batching	Piling up a type of work as it comes in until a later time when all this type of work is done together
Bottleneck	Part of the system where patient flow is obstructed, causing waits and delays
Capacity	Resources available to do work. For example, the number of pieces of equipment available multiplied by the hours of staff time available to run it
Constraint	The actual cause of the bottleneck. Usually a necessary skill or piece of equipment [NB Goldratt uses constraint to mean the same as bottleneck, but recognises that there are different types of constraints]
Demand	All the requests/referrals coming in from all sources
Hand-off	When the patient is passed on from one healthcare professional to another
Lead time	The time it takes for a patient to move all the way through a process
Parallel processes	Different activities that take place in the same time period
Queue	Work waiting to be done at a given point e.g. patients waiting to be seen in the clinic or people on a waiting list to come in to hospital for surgery
Scope	A definition of the boundaries of the area under examination. For example, the beginning and end points of the patient journey under review
Slice	This is a specific group of users that experience the whole of the service you are considering e.g. all the patients with suspected bowel cancer referred from one PCT to one surgeon in one Trust and on to one oncology department
Value added time	The time that actually adds value to the patients journey

The Improvement Leaders' Guides have been organised into three groups:
General improvement skills
Process and systems thinking
Personal and organisational development

Each group of guides will give you a range of ideas, tools and techniques for you to choose according to what is best for you, your patients and your organisation. However, they have been designed to be complementary and will be most effective if used collectively, giving you a set of principles for creating the best conditions for improvement in health and social care.

The development of this guide for Improvement Leaders has been a truly collaborative process. We would like to thank everyone who has contributed by sharing their experiences, knowledge and case studies.

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