

## Quality Improvement Project Guide

Welcome to the step-by-step workbook which is designed to guide you through a quality improvement project.

### Before you start

Some of you will be familiar with the concepts of quality improvement and patient safety as applied to healthcare, others may be less confident.

This [paper on quality improvement in healthcare by Paul Batalden and Frank Davidoff](#) gives an overview of the benefits of quality improvement and what is needed to produce system change. Using this workbook will help you to think about your particular contexts, ensuring that you undertake measured improvement and that you consider what you need to know to “make things happen”. We expect that most of you will be working on improving your microsystem (ie care provided by your team or department) but this may lead onto bigger changes in future.

You can watch this [BMJ video on quality improvement](#) to get an overview.

### Getting started

You may already be clear about the focus of your improvement project - if you are not then this step is for you.

### **Thinking about quality in healthcare**

You might find it useful to think about what good quality care looks like and where your care could be better. The [Institute of Medicine in the US published a report back in 2001](#) which identified six dimensions of quality care - that it is safe, timely, effective, efficient, equitable, and patient centred (STEEEP). How does the care your team provide measures up?

Alternatively think about what works well and what frustrates you during your work. You can then brainstorm with your team whether this is related to:

- Structures - infrastructure that impacts on quality or outcomes of care, eg staffing ratios on a labour ward
- Process - activity which occurs for patients or populations, eg every patient with a stroke has a brain scan within 24 hours or every patient with diabetes in a population receives structured diabetes education
- Outcomes - the end result of healthcare, eg mortality from sepsis. Patient related outcome measures (PROMS) and patient experience are important outcomes to consider.

**The local context:** Alternatively, use sources of feedback to identify where care could be improved. Look at recent adverse events or complaints or review positive feedback from patients and see how that could be applied to other aspects of your care. Consider having

brainstorming sessions with your team to help get them engaged in the process and to ensure making the improvement is important to them.

Your organisation is very likely to have its own transformation programme focussing on key local priorities, reducing pressure ulcers for example. Linking in with the clinical governance and quality improvement teams will help align your work to these wider goals which will make it easier to get support and to sustain your change.

**The wider context:** [BMJ Quality Improvement Reports](#) provides a fully searchable open access repository of quality improvement projects. Why not read what others have done and learn from their experiences? Our [blogs](#) and [videos](#) are also a great place to get ideas.

There are many [patient stories](#) which provoke ideas on change and can provide a powerful tool for engaging people with your project. The [National Institute for Clinical and Healthcare Excellence in the UK publishes Quality Standards for structures](#), process and outcomes across different clinical areas which can be used for project topics. You may also want to get your team involved in a national level improvement project or look at national health outcome priorities.

### Improvement models

There are many different models and approaches that can be taken to improve quality in healthcare such as lean, six sigma, a value based approach or even a high quality complete audit cycle where you implement and measure change. In this workbook we use the [Model for Improvement](#) approach to frame quality improvement work but you may find another approach is more suitable for your context and you can still capture your learning using this workbook and submit your work for publication in BMJ Quality Improvement Reports.

The Model for Improvement asks three questions:

What are we trying to accomplish?

How will we know change is an improvement?

What changes can we make that will result in the improvements that we seek?

The model then suggests using the plan, do, study, act cycles to test change. Even if you don't use PDSA methodology using the three questions to frame your improvement project is likely to be helpful. Watch our PDSA explainer video [here](#) to find out more about this approach or [read this blog](#) about how to run a quality improvement project using the Model for Improvement.

### Problem

Once you have identified the topic of your project you need to decide what the scope of your project will be and set your project aims by asking the question, "What are we trying to accomplish?" Writing your aims statement is important as it allows your team to agree clear,

defined goals. These can help to keep your work focused as you go through your project and help you work out how you will make your improvement happen.

You could use the Institute of Medicine STEEEP domains to inform your aims. Another approach to setting effective aims is to make them “SMART”:

- Specific - what are you trying to achieve and for who?
- Measurable - by how much will things have improved? Compared to what?
- Achievable - is this aim within your power to achieve with the resources that you have available? Sustainable projects start small and then grow and spread.
- Relevant - what is the point of this goal? how does it improve outcomes, processes or structure? (See section 2)
- Timely - by when will you achieve it? Remember this can be a short time - [watch this video](#) about a project done in just nine days!

A good aims statement might be: “To reduce the number of missed doses of medication for all patients on six elderly care wards within our hospital by greater than 50% compared to current practice. This will reduce medication error by ensuring patients get medications in the prescribed doses and thus aim to improve the effectiveness of their medication”. [Read more about this project in BMJ Quality Improvement Reports.](#)

*When completing the quality improvement report submission template you will be asked to input the following text for this section:*

Summarise your problem, the focus of your project and your SMART aims. Give some details about your local context including; the type of organisation you work in, the size of your organisation, and perhaps a little about your local patient population. It might be useful for others to include how you got started with this project and what drove you to tackle this problem. There is a good example in this paper entitled; [Making the journey safe: recognising and responding to severe sepsis in accident and emergency](#)

## Background

It is important to undertake background research about your problem and possible solutions. This can be separated into two sections: researching the existing literature and researching your local context. Gathering data on the impact of the problem you are seeking to improve (for example, the impact on patients of an extended hospital length of stay in terms of risk of venous thrombo-embolism) will help to build your case for change, such as improving and reducing length of stay. Some people are more persuaded by facts and figures whilst others respond to narrative and values so it's important to harness both of these as drivers for change.

Looking locally and more broadly may also provide some useful information into what solutions already exist, whether they have succeeded or failed, and lessons you can learn from them. There may even be materials you can adapt and adopt to your environment. For example, a particular solution you're looking for in adult medicine may already exist in paediatrics, so you may be able to tailor an existing solution to the needs of your patients.

Useful sources for background research include:

- [BMJ Quality Improvement Reports](#)
- [BMJ Quality and Safety](#)
- [Health Foundation Shine Projects](#).

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Summarise the literature you have found on the background to your problem here. What existing evidence is there that this problem exists? What evidence is there that other people have tried to solve this problem in the past? Is there any evidence for what works and what doesn't to solve your problem? Ensure that those reading about your project from a different clinical or professional background or another country will be able to understand the scale and importance of your problem and its context. There is a good example in this paper entitled; [A change of culture: reducing blood culture contamination rates in an Emergency Department](#).

### Measurement

Having now identified the problem and carried out relevant background research, it is important to gain a measure of the problem. This enables you to answer the second question from the Model for Improvement, "How will we know change is an improvement?" by allowing comparison to what currently exists. It will also help build your case for change alongside your background research by outlining the scale of the existing problem within your local context.

Decide what your structure, process or outcome measures will be. You should have started to consider what these would be when setting your aims statement. Some examples of measures might be:

- Evidence of local arrangements to monitor creatinine levels and urine outputs for those at risk of acute kidney injury (structure)
- The number of patients on your post-surgical ward who have their creatinine level and urine output checked within four hours of surgery (process)
- The number of patients on your post-surgical ward who develop acute kidney injury – ie, the incidence (outcome).

You are likely to collect more than one type of measure during your project but this may not include structure measures. Try to consider how you can capture outcomes as these ultimately are what matter most to patients. However, it is critical for healthcare to have reliable processes to deliver the right care to the right patient every time. You will also need to decide how to express and communicate these measures most effectively, for example as a whole number or as a percentage change.

Don't forget that you will be collecting these measures continuously - or frequently - throughout your project. You may wish to start thinking about how you will obtain continuous measurement throughout your project. At the very least we would expect data collection at

baseline, during every PDSA cycle and after your final PDSA cycle. This [QIR project about improving weekend handover](#) is a good example of a project with multiple measurement points. Successful and sustainable changes are more likely the more times an intervention has been tested and improved. Try to think about how you will continue to monitor your intervention beyond the completion of your project as well.

You should also consider what balancing measures you will collect during your project. Balancing measures try to assess what impact your improvement is having elsewhere in the system. The aim is to avoid improving one area of care to the detriment of another area; for example [this QIR report](#) on screening for delirium identified increased paperwork burden for staff as a balancing measure to be monitored.

You can read more about measures for improvement in this guide from the [Patient Safety First campaign](#) in the UK or this guide from what used to be the [NHS Institute for Innovation and Improvement](#).

*When completing the quality improvement report submission template you will be asked to input the following text for this section:*

Describe which measures you selected for studying processes and outcomes of the intervention(s), including rationale for choosing them, their operational definitions, and their validity and reliability. Describe how you plan to collect this data throughout your project and how frequently. Outline how you plan to establish if the observed outcomes are due to your interventions.

You must also include here, a description of the results from your baseline measurement. This section will be included in your final report or journal article so you should capture your reasoning as well as your results. If you wish to upload your baseline data as supplementary material to this step then you may. However, you may wish to simply upload all your project measurement data, including baseline measurement, in the later measurement section. There is a good example in this project entitled; [Improving communication between phlebotomists and doctors: a quality improvement project](#).

### Ready to go

By this stage you should have finished all the preparation to get going with your project. Although these steps seem lengthy you can move through them fairly quickly. Now you have set your aims and undertaken your baseline measurement you need to think about what resources you will need to “make things happen”. This doesn’t mean what changes you need to make but who you need to involve in your project and sources of support.

One common way of looking at this is to do some [stakeholder mapping](#). This allows you to identify who is important and influential to the success of your project who you need to keep informed and who is interested and invested in its success but doesn’t necessarily have much influence. Involving patients as key stakeholders to ensure your project aims are aligned with the needs of patients and reflect their views is critical.

At this point you should also identify and invite a mentor to your project, if you haven't done so already. This is likely to be someone who is actively interested and invested in your project with some senior influence – for example your head of department. You should also identify and gain support from a senior sponsor at the executive level within your organisation who can help champion your project. Having aligned your aims to the goals of your organisation will help with this process.

You should also identify and invite team members. Successful projects are multi-professional so ensure you engage team members from different professional groups to help bring different perspectives and enable different aspects of your change to succeed. This [QIR report on reducing mortality for patients with hip fracture](#) is a great example requiring input from surgeons, geriatricians, nurses, and physiotherapists among others to be successful. Don't forget to allocate specific roles within your team - for example, a project manager to keep the project on track.

We also recommend recruiting a patient to be a formal part of your project team. This will not only benefit your project but projects which do so are more likely to be accepted for publication in BMJ Quality Improvement Reports as part of [our patient partnership](#). You can find some useful resources for involving patients in quality improvement and clinical audit from HQIP [here](#).

You should complete a project charter at this point; this will help to summarise your thinking and guide the next stages of your project. It can also be used to quickly communicate the main aims of your project to stakeholders.

### Ethics and duty of candour

There are two potential issues that you must think about before starting your project activity - ethics approval and duty of candour.

There is a spectrum between research which requires formal ethical approval and quality improvement activity, which usually does not. However it is important to consider ethics as part of all quality improvement work.

The [WHO guidance](#) distinguishes between patient safety research and patient safety activity and provides a helpful overview if you're not sure where your project lies on the spectrum. The [HQIP quality improvement ethics guidance](#) is also helpful; you may wish to use the screening questions on page 6. This guidance also comments on why a research ethics committee may not be well placed to consider quality improvement projects on page 8.

Our ethics policy mirrors [that of BMJ Quality and Safety](#) and we require authors to make a simple statement about ethics approval on submission to our journal. We would expect most projects to be subject to an ethical review of their proposal, ie looking at a risk-benefit analysis to patients, considering whether the project contravenes any with ethical principles etc, but would not usually expect this to go through the organisation's research ethics committee. We would expect this function usually to be served by internal governance structures such as clinical audit leads or the audit committee and you should explore what is required in your organisation before starting to make your change.

The duty of candour in the UK came into effect in 2014 and is a legal duty on hospital, community, and mental health trusts to inform and apologise to patients if there have been mistakes in their care that have led to significant harm. It aims to help patients receive accurate, truthful information from health providers. There is also a duty of candour that applies to individual healthcare professionals. Every healthcare professional must be open and honest with patients when something goes wrong with their treatment or care which causes, or has the potential to cause, harm or distress.

Although these are covered legally and in [professional guidelines from the General Medical Council](#) in the UK, all users should consider their duty in this respect. If you discover any information that makes you concerned for a patient's wellbeing during your quality improvement project, it is important that you raise your concerns with your team and consider with them whether the patient and their healthcare team need to be informed.

### Sustainability

With any change there is a risk that improvements gained may gradually be lost over time as focus and enthusiasm moves on to other areas. Considering the sustainability of your project from an early stage to maintain your aims long term is critical. The NHS sustainability model is a useful framework for thinking about sustainability, focusing on three areas of process, staff and organisation. You can read a detailed [guide to the model here](#) or simply use the images from the model to think about how you will build sustainability through different aspects of your project.

Some key points from the model:

- Recognise the impact that change processes may have on staff roles - ensure you communicate well and invite feedback. Setting clear aim to share your vision and stakeholder mapping will help you to do this
- Highlight benefits to staff that go beyond improving care by thinking about how you will be making their lives easier. Engaging staff in process mapping will help you identify how your change project might do this and balancing measures will help you recognise when the opposite is occurring
- Using appropriate measurement, testing it using PDSA or other evidence based improvement methodology and presenting this evidence in an engaging way will help give credible evidence to sustain your change.

### Process mapping

The causes of a problem are usually multi-factorial and it needs to be observed from many different perspectives. Process flow maps are one tool for mapping out and understanding a problem, patient journey, or clinical pathway, and highlighting possible areas for intervention such as bottlenecks or unnecessary handovers.

Think about what you need to know to map out your process, who is involved, how to get their views and how simply you can describe it. Most processes overlap with other processes in the organisation so decide the scope of your project. Think about the level of detail you require. Often it is best to start with a high level overview map to help you select which steps of the process you need to drill down into in detail.

The next step is to gather all the information into a [process flow map](#). Ideally, you should gather all relevant stakeholders, including patients, together in a room to create your process map. Alternatively, the project team can map out the process themselves using sources of information such as patient journey walkthroughs, staff input, or analysing recent patient records. Although it sounds obvious, you must ensure you record the process as it currently happens rather than the idealised version which may be enshrined in your guidance or policies.

This [QIR report about improving the process of phlebotomy in a children's hospital](#) shows how important constructing a process map can be in understanding how things can be improved and [this report about reducing door to needle time for patients with a myocardial infarction presenting to an emergency department](#) demonstrated a great improvement with a simple process change even though this change took time to achieve.

Experience based co-design (EBCD) is one method of ensuring that any service improvement initiative focuses on person-centred care, and the [King's Fund EBCD toolkit](#) takes you step by step through this approach to describing your problem and understanding it from a patient perspective.

Process maps are not routinely included in the journal but may be submitted as supplementary material if desired.

## Design

Once you have completed your process mapping you should be able to start to answer the third question from the model for improvement: "What changes can we make that will result in an improvement?"

You can identify areas to change to make an improvement from your process map by looking at steps in the process you can:

- Eliminate
- Combine
- Simplify
- And then look at improving the sequence

While looking at these areas you should consider timing each step if you haven't done so as part of your process mapping to see where you can make maximum gains. You should also think again about balancing measures to identify the steps where change is most likely to have an impact elsewhere.

You can then come up with actions that you wish to implement as small tests of change through your PDSA cycles or other improvement methodology.

*When completing the quality improvement report submission template you will be asked to input the following text for this section:*

Once you have an idea of the intervention (or series of interventions) that you will implement to improve the quality of care you deliver, describe it here. Describe any reasons or



assumptions that were used to develop the intervention(s) and reasons why you expected them to work. Did you consult with any team members or organisations? Did you anticipate/predict any problems at this stage? How did you plan to make the intervention sustainable in the long-term? Outline who was in your project team.

This step is critical for others to understand the thinking behind the development of your intervention. There is an example in this article entitled; [Improving asthma severity and control screening in a primary care pediatric practice](#).

### Strategy

The next step is to implement change through making small tests of change, learning from them, and scaling up and embedding change over time. You should be measuring throughout each plan, do, study, act (PDSA) cycle and using the results of those measures to inform the next cycle.

Although the PDSA methodology appears simple, it is often not well implemented in practice. [This review highlights common aspects of the PDSA cycle that quality improvement teams miss out during their improvement work](#) and is a useful resource for helping to ensure you deliver high quality PDSA cycles.

In a continuous improvement process, PDSA cycles may keep repeating, however it is likely that you will reach a steady state where you are continuing to measure the impact of your improvement without changing it significantly.

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For each PDSA cycle you should; describe your aim, your change hypothesis and strategy for change. Describe how you implemented the change and the data you collected. Describe your key learning from each cycle of change, and discuss how this learning impacted on your change process. How well did your predictions of what change was needed match your outcomes? What worked more effectively than anticipated and what had less effect than predicted? There is a good example in this paper entitled; [“The constipation conundrum”: Improving recognition of constipation on a gastroenterology ward](#).

### Results

During each PDSA cycle or throughout your improvement process, you should be testing the impact of your intervention in real time. You should incorporate continuous measurement into your PDSA cycles otherwise you will not be able to use evidence to assess and improve each iteration of your intervention. You can demonstrate improvement with a relatively small number of data points: more than 12 are needed for valid statistical analysis. Each data point can have a small sample size if necessary - around 10 as a minimum.

You can plot a run chart to record your data and to assess whether statistically significant improvement has occurred during your PDSA cycles. [This paper by Perla et al](#) gives a good

overview of how to plot and interpret run-charts. You may wish to use [statistical process control charts](#) to record and interpret your data. Record your balancing measures and any qualitative data you have used to assess the effects of your intervention such as usability, effect on patient experience or impact on staff workload.

You may find that your change process has not significantly improved your service. That data is also very important so include it here.

*When completing the quality improvement report submission template you will be asked to input the following text for this section:*

Provide a summary of what your results and run-chart/control chart showed. Describe the variation in your data. Were the interventions you made responsible for any improvements? Describe how contextual elements interacted with the intervention(s) and affected your results. Compare your results to your baseline measurement.

Comment on how you assessed whether the data was complete and accurate- was there any missing data? Please comment on whether there were any unintended consequences such as unexpected benefits, problems, failures or costs associated with the intervention(s). There is a good example from this paper entitled; [Low stimulus environments: reducing noise levels in continuing care. Run-chart available here.](#)

### Spreading your intervention

Having implemented your intervention locally, it is important to consider how your intervention will be spread or rolled out within your clinical environment. This means sharing the intervention beyond your own team or department to other areas in your organisation which could benefit from making the same intervention to their working practices. This could also include sharing and spreading it beyond your own organisation.

Think about how you will achieve this. This process can be difficult and requires a lot of detailed consideration. Some points to consider are:

- Which teams or departments are you going to target?
- Which groups of employees within these are key, for example nurses or ward managers?
- How are you going to let them know about it?
- How will you encourage them to engage with your intervention?
- What mechanism will you have for learning from their feedback?
- What materials or resources will you need to do this?

Often the process of doing this is similar to doing further PDSA cycles, but this time testing your change on a much wider scale.

Bear in mind that you might not be best placed to spread your intervention beyond your project. The Institute for Healthcare Improvement has identified “[7 Spreadly Sins](#)”, or what

NOT to do to successfully spread healthcare improvement and we recommend using these to form your spread plan. There are more details on how to do this in [this powerpoint](#).

Conclusions and learning from this section should be summarised in your lessons and limitations section or in your conclusion.

### Lessons and limitations

An important part of carrying out a quality improvement project is enabling others to learn from your experiences. A particular problem within healthcare is that there is a significant amount of unnecessary duplication of effort. Sharing your thoughts on what you learnt from this project will assist others in avoiding the pitfalls that you encountered and will help you to think about how you might do things differently next time.

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In this section, which will be included in your final report or journal article, discuss the lessons you learnt from the project and its limitations. Comment on the strengths of the project. Describe any problems you faced and how you navigated these. If you were to undertake this project again, what would you do differently?

Reflect on your project's limitations. For example, did you realise as the project was implemented that your results would be affected by unforeseen factors such as a small sample size or the turnaround of patients or staff? Comment on the limits of generalisability. Describe whether chance, bias, or confounding have affected your results and whether there was any imprecision in the design or analysis of the project. Are more data points required? Were efforts made to minimise/adjust for any limitations?

Although we accept publications using different improvement approaches, we would expect you to have modified your intervention as it was implemented and undergone a process of continuous improvement, measurement and learning. If your project does not fit with this approach then we would like to see reflections and learning here about how you could have incorporated continuous improvement and measurement approaches in your project. There is an example which can be found in this project entitled; [Improving communication between phlebotomists and doctors: a quality improvement project](#).

### Conclusion

*When completing the quality improvement report submission template you will be asked to input the following text for this section:*

You should reflect on your background research, noting what is already known on this topic and what your project adds. You should refer back to your aims statement – did your project achieve its aims? Did you adjust your aims as you went along? Was it a useful project? Were your measures appropriate and did you use balancing measures? Think about what

your senior sponsor would like to see as an output of your work and what can help others to make the case for undertaking a similar piece of work – or for doing something differently if your project was not successful. Please describe your cost analysis here, were there any financial savings that your project made? Being able to demonstrate that your intervention delivered savings really helps to add value.

Give an assessment of whether you think your project is sustainable- do you have enough data? What have you done to try to ensure that your work continues? Comment on how your project could be spread and whether it could be replicated elsewhere. Discuss what your next steps will be and whether further study in the field is required.

The point of the conclusion is not to rewrite the whole project, but to give an overview of how the whole project was conducted, what it achieved, and some personal reflections. There is an example from this paper entitled; [Making the journey safe: recognising and responding to severe sepsis in accident and emergency.](#)