

QUALITY IMPROVEMENT GUIDE

Quality Improvement – the key to
providing improved quality of care



health

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FOREWORD BY THE DIRECTOR GENERAL

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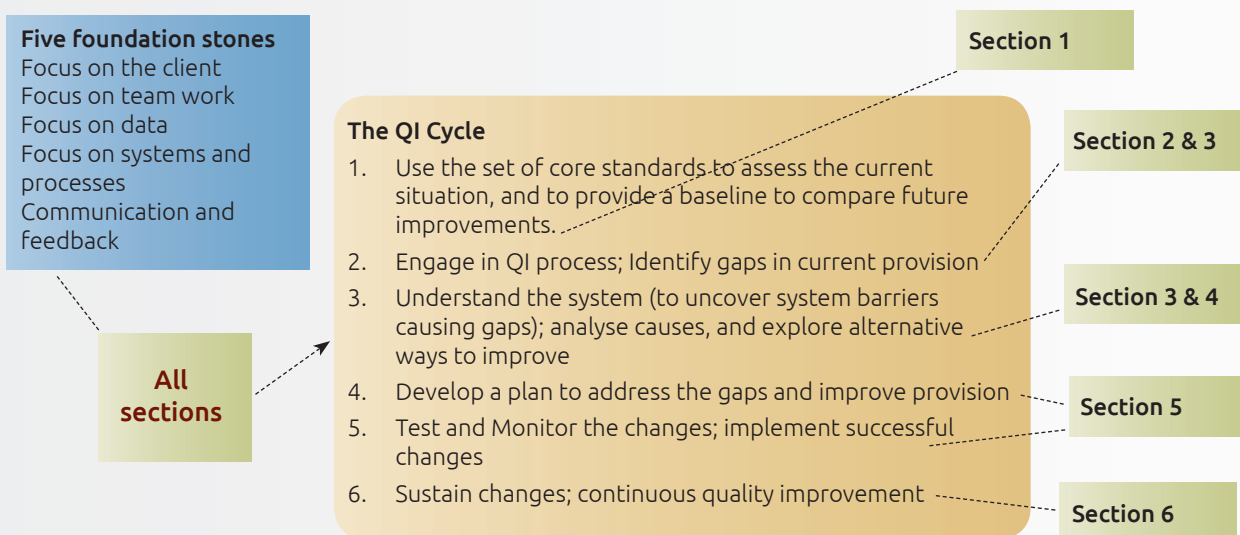
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OUTLINE OF THE QI GUIDE

The Quality Improvement (QI) Guide aims to encourage a shared understanding and approach to quality improvement across all health establishments. Together with the National Core Standards, the tools provided in this QI Guide aim to assist quality coordinators, managers and supervisors of both hospitals and clinics to ensure quality of care in our health care delivery system.¹

- **Section 1** – describes the context in which the QI Guide has been developed, including a brief summary of the key elements of the National Core Standards.
- **Section 2** – outlines the five foundation stones of QI and provides a framework for the QI cycle.
- **Section 3** – describes the practical application of the five foundation stones and gives an overview of some of the key elements involved in initiating the QI process, including forming a team, process mapping, and ways to understand and analyse the system.
- **Section 4** – gives examples of QI tools and methods with a focus on those which assist in problem identification and analysis.
- **Section 5** – looks at the PDSA quality improvement cycle (Plan, Do, Study, Act) and A3 Reports as useful frameworks to plan test and implement improvements.
- **Section 6** – concludes with a discussion concerning the importance of scaling up and sustaining change.

Figure 1 – Overview of the QI Cycle as outlined in the QI Guide



¹ Other documents which address quality improvement includes: Primary Health Care Supervision Manual (DOH 2009) and The Five steps to Quality Improvement: A facility based guide to improving clinical outcomes and quality mentorship. Institute for Healthcare Improvement, Department of Health, University of KZN/20,000+

1. INTRODUCTION

1.1. Overview

In September 2010, the Minister of Health signed a Negotiated Service Delivery Agreement (NSDA) which set out the plans and interventions required to improve our health outcomes and strengthen the effectiveness of our health system – to help ensure a better life for all South Africans. Improving quality of care is one step towards a strengthened health system and includes the establishment of an independent regulator of compliance with prescribed norms and standards, through an amendment to the National Health Act.

The Office of Standards Compliance has developed the National Core Standards for Health Establishments in South Africa² – with six key priority areas. These standards have provided a basis to measure health systems' performance in quality and service delivery. The National Core Standards are designed to be used by all managers and supervisors as a guide to expected service planning and delivery, and by all health care workers to identify gaps in health systems.

The primary purpose of the National Core Standards is to:

- develop a common definition of quality of care in all health establishments as a guide for the public, managers and all health care workers;
- establish a national benchmark against which health establishments can be assessed;
- provide a common tool to identify gaps, appraise strengths and guide quality improvement; and
- provide a framework for the certification of health establishments.

Many health establishments are already using the results of the external audit³ to provide a baseline, together with the tools developed to measure compliance with the standards. In doing so, they have begun the process of conducting their own assessment to measure the quality of care and identify gaps in the health system. *It is important to ensure that the measurement of quality does not become an end in itself, and that assessments are followed by an intensive, carefully monitored quality improvement process.* This guide is intended to meet this need.

1.2. Defining quality

The terms *quality* and *quality improvement* have many different meanings depending on the context. The Department of Health (DOH) uses the following working definition of quality improvement (QI):

QI is achieving the best possible results within available resources.

To this end, QI includes any activities or processes that are designed to improve the acceptability, efficiency and effectiveness of service delivery and contribute to better health outcomes as an ongoing and continuous process.¹

² National Core Standards for Health Establishments in South Africa, DOH 2011

³ The baseline audit was done by the Health Systems Trust in 2011 on behalf of the DOH. It focused on the six priorities and a comprehensive facility audit.

'Best possible results' can be defined in several ways:

- meeting standards
- meeting targets or compliance with norms
- reliable implementation of best practice /guidelines

In the past, different QI initiatives have used varied approaches in the design, implementation and monitoring of QI interventions. Linked to the coordinated implementation of the National Core Standards, the DOH has identified the need to develop a systematic and coherent approach to QI. This includes the design, planning and implementation of QI activities across all health programmes and units. It is within this context that the QI Guide has been developed.

A core function of management at all levels is to get the job done in the best possible way, with the best possible results. Ensuring 'quality' is therefore central to the job of any manager.

It is also important that managers and staff from all components and levels of the system are actively involved in implementing QI to strengthen the health system. This will help ensure that this process is not seen as a one off project or a set of solutions imposed by senior leadership. This guide encourages collective ownership of the QI process and emphasises the importance of a team approach.

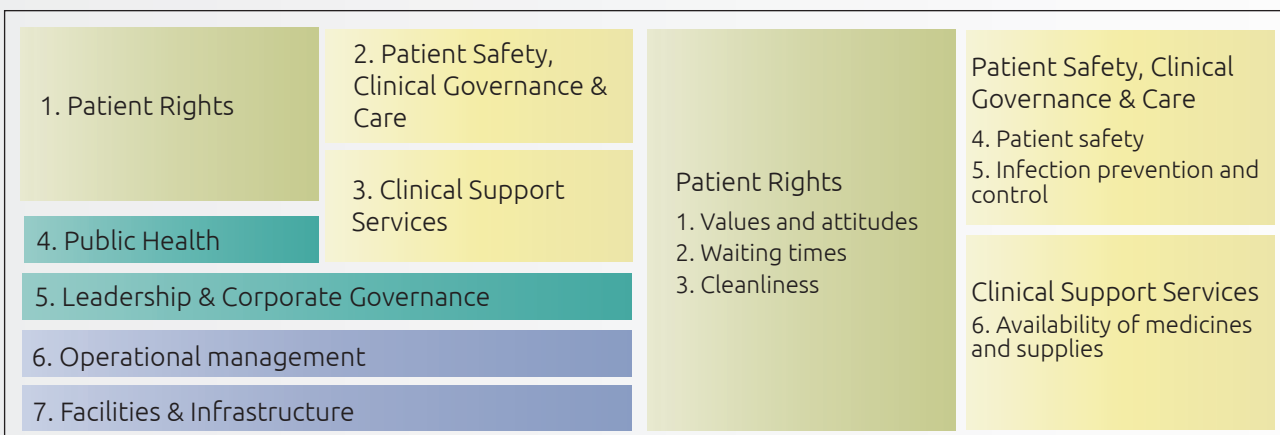
1.3. National Core Standards

This section provides an overview of the National Core Standards and the associated tools which have been developed to ensure effective implementation. This includes an overview of the seven domains and six priorities identified by the DOH, as well as the structure of the standards, measurement or assessment tools, analysis and reporting.

1.3.1. National Core Standards and six priorities

The National Core Standards are divided into seven domains, which are areas of potential risk to quality or safety. An important sub-set of the standards are the six priorities that the DOH has identified for immediate implementation. Figure 2 below details the seven domains and six priorities that make up the National Core Standards.⁴

Figure 2: National Core Standards – seven domains and six priorities

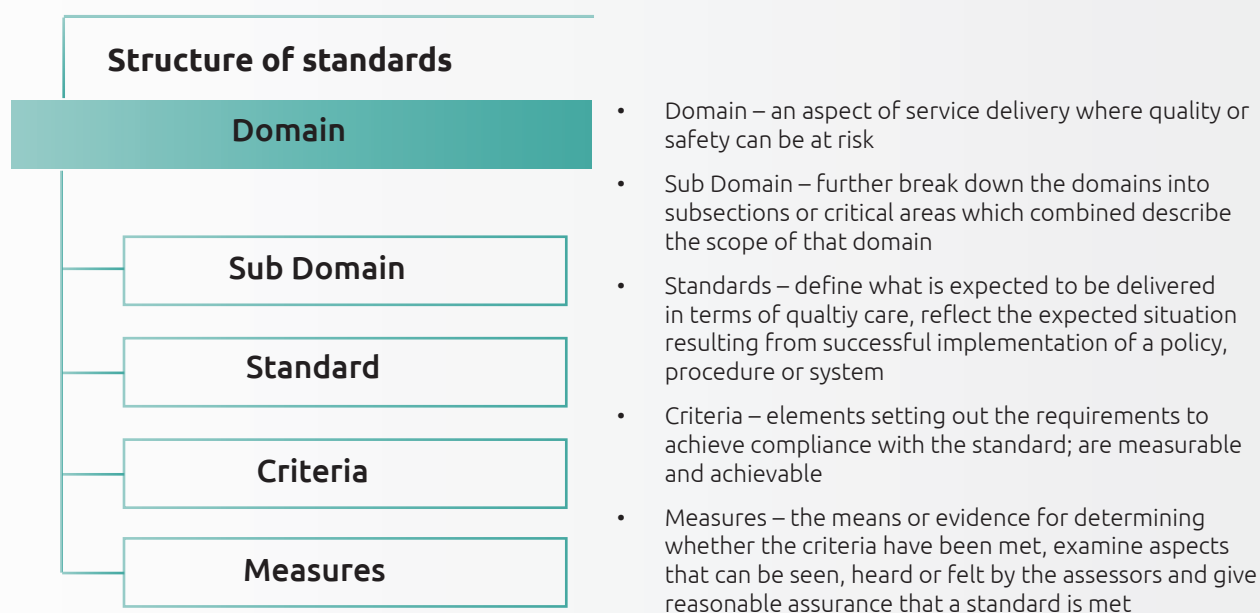


⁴ Three key resources have been developed by the DOH to support the implementation of the National Core Standards
 (i) National Core Standards for Health Establishments in South Africa, DOH 2011
 (ii) National Core Standards for Health Establishments in South Africa, Abridged version DOH 2011
 (iii) Fast Track to Quality: The six most critical areas for patient centered care, DOH 2011

1.3.2. National Core Standards: structure and measurement tools

The National Core Standards are divided into *domains*, *sub-domains*, *standards* and *criteria* – with increasing levels of detail. The audit tool developed to assess compliance breaks the standards down into a set of *measures*, which describe the means or evidence used to determine whether the criteria have been met (as shown in figure 3).

Figure 3: Structure of standards and a definition of terms



1.3.3. Assessment tools and reports

Several tools are used to collect information to determine compliance. Information relating to a health establishment’s profile and a set of questionnaires with related *measures* and *checklists* are used to calculate a score reflecting the degree of compliance. These tools are directly linked to the domains, standards and criteria. The assessment tool is also divided into *functional areas* which represent different service delivery and operational areas within different types of health establishment.

Assessments can be performed by an external inspection team (currently DOH’s Office of Standards Compliance inspection team, and in the future through the independent Office of Health Standards Compliance Inspectorate), or as part of an internal self-assessment process, thereby assisting in identifying gaps needing improvement.

Results are collated into the National Core Standards Module in the District Health Information System (DHIS). A report is generated which scores each health establishment’s level of compliance. Three separate reports are available – by *domains* *functional areas* and the *six priorities*.

2. QUALITY – KEY CONCEPTS

This section provides an overview of the basic tenets underpinning quality. This includes the five foundation stones of QI and a summary of QI as a continuous cyclical process.

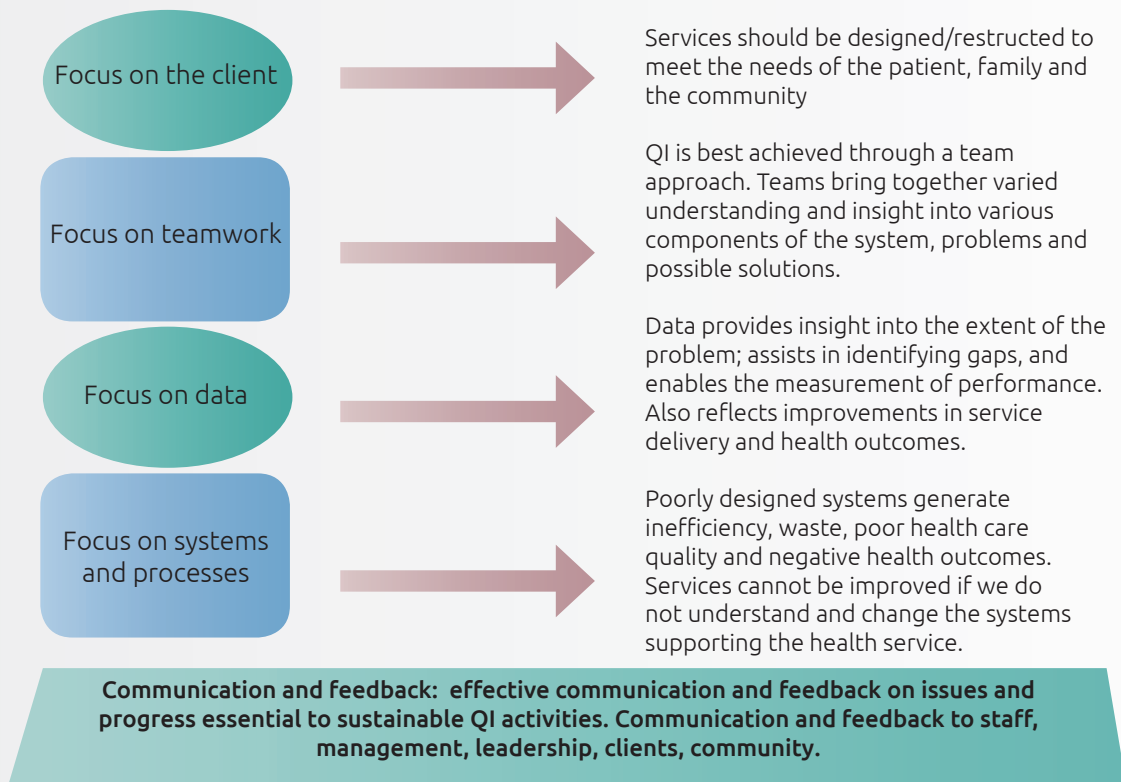
2.1 Five foundation stones or principles of quality improvement

Before formulating improvement plans, it is important for the team to understand the basic principles of improvement. There are five important foundation stones on which to build a quality improvement process:⁵

- Client
- Teamwork
- Data
- Systems and processes
- Communication and feedback

Applying these foundation stones (figure 4) has been shown to improve processes of care, even within weak health systems that face severe material and human resource constraints.⁶ Section 3 unpacks and explains the practical application of these five foundation stones.

Figure 4: Five foundation stones of quality improvement



⁵ Adapted from: Massoud et al: A modern paradigm for improving healthcare quality. QA Monograph series 1(1), Quality Assurance Project 2001

⁶ Silimperi DR, Miller Franco L, Veldhuyzen van Zanten T, and Mac Aulay C, "A framework for institutionalizing quality assurance," International Journal for Quality in Health Care 14(2002)67-73

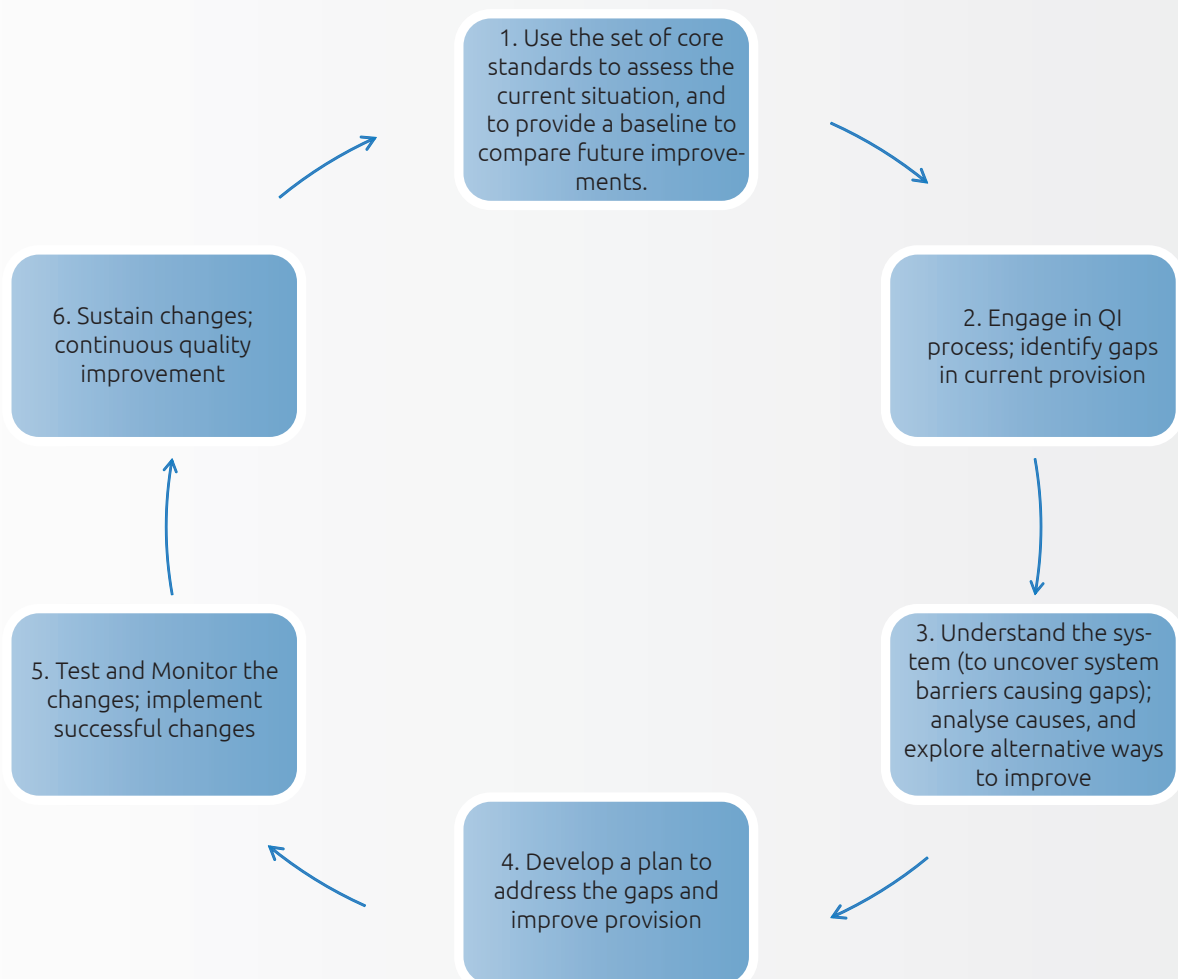
2.2 Understanding the cycle of quality

The QI cycle is an ongoing and systematic way to improve health care systems and processes so that they are safe, effective, efficient, patient-centered, reliable and timely – based on data and other forms of evidence.

The process of identifying gaps is part of a larger cycle of quality assurance and improvement, as depicted in figure 5. This cycle includes the use a set of agreed standards for assessment, a gap analysis and problem solving, a process for trying out, testing and measuring changes, and sustaining changes.

The cycle is an ongoing and systematic way to improve health care systems and processes so that they are safe, effective, efficient, patient-centered, reliable and timely –based on data and other forms of evidence. The six steps of the QI cycle are unpacked further in Sections 3-7.

Figure 5: QI as a continuous, cyclical process (Steps 1-6)

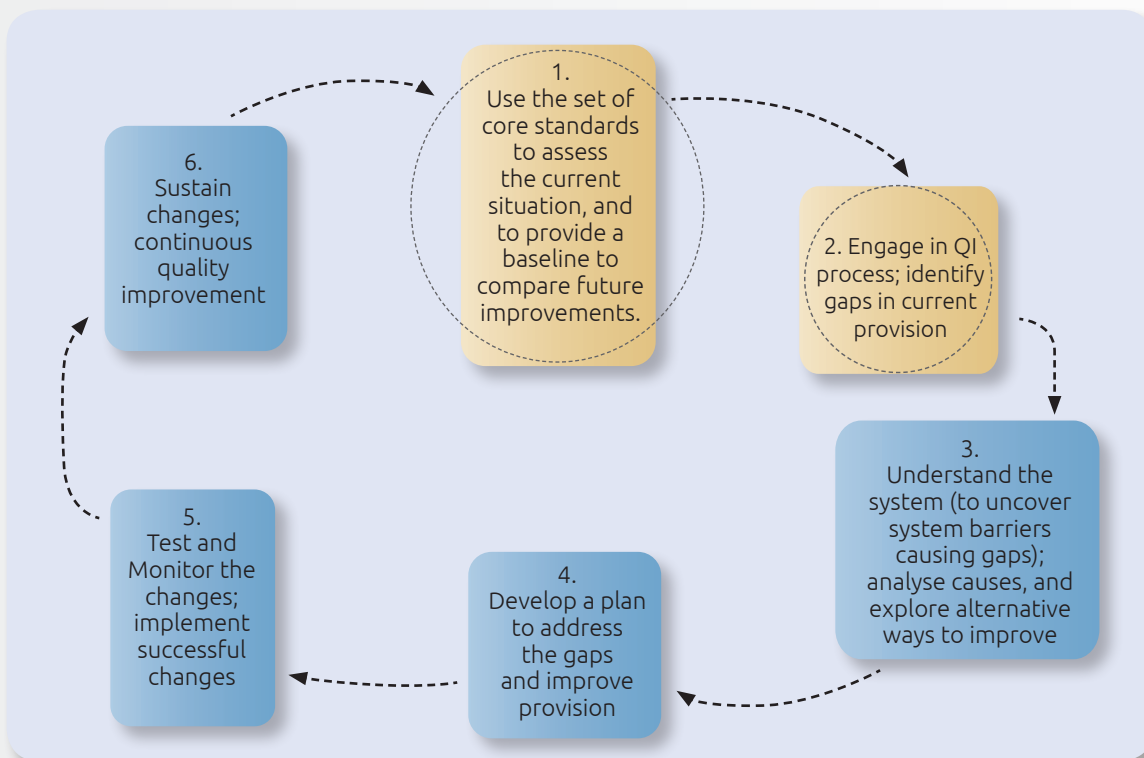


3. THE QUALITY IMPROVEMENT PROCESS

This section looks at the practical application of the five foundation stones for QI (as outlined in Section 2), highlighting how they combine to contribute to effective implementation of QI.

The importance of the client and of teamwork; using data to set targets and measure quality; ensuring a systems approach, along with communication and feedback are all cross cutting principles. Together these five foundation stones apply to the entire QI process. They also provide the basis for initiating the QI process – steps 1 and 2 in the QI cycle (see figure 6 below).

Figure 6: QI as a continuous, cyclical process (Steps 1 & 2)



The rest of this section looks at each foundation stone in more detail.

3.1 Focus on the client

Services should be designed or restructured to meet the needs of the client, their family and the community. The client’s needs should be at the heart of all QI activities. It is therefore important to ensure there are effective channels for the voice of the client – such as patient satisfaction surveys and systems for client feedback.

The National Core Standards – in particular Domain 1 which covers patients’ rights – and the six priorities focus on quality from the client’s perspective. These client-focused standards need to be measured and analysed, and should form an integral part of the QI plan.

3.2 Focus on teamwork

3.2.1 Forming an improvement team and defining problem areas

QI is best achieved through a team approach. Teams bring together varied understanding and insight into the various components of the system, problems and possible solutions.

The formation and composition of QI teams will vary – there may be existing QI teams or new ones may need to be formed. A large health establishment may require several QI teams, in their respective functional areas. Smaller health establishments may only require one team. Some health establishments have dedicated QI coordinators, while others rely on a member of staff to assume this role.

An improvement leader should be identified – either by the team or management. The improvement leader is the key contact person for the team. Improvement leaders should be able to motivate the team, sustain momentum, schedule regular meetings, and most importantly, follow up on the improvement plan.

Ideally, the QI team should comprise frontline staff and should drive the continuous QI process within the health establishment. Team members should include those interested in QI and/or those who are involved in the area that needs improvement. The team should be multidisciplinary and relatively small. Where possible, client representation on the team is encouraged.

3.2.2 Selecting changes that lead to improvement

Ideas for change may come from the insights of those who work in the health system, from change concepts or other creative thinking techniques, or by learning from and replicating the successful experience of others (this links to Step 1 and 2 as shown in figure 6).

The baseline audit⁷ and subsequent assessments using the National Core Standards, provide a comprehensive framework to assess strengths, identify gaps, and based on this, develop quality improvement plans. It is suggested that the team begins by reviewing the domains, functional areas and the six priorities to identify areas which are non-compliant and consider possible reasons for non-compliance.

In some cases, the reason for non-compliance is clear and easy to correct (a quick fix). If so, the team should develop an action plan to list what needs to be done, who will do it, and when it will be done. Some issues may be more difficult to resolve. In these cases, the team needs to engage in a process of problem-solving, and where useful, use QI tools to discover underlying causes and explore possible solutions.⁸

To facilitate overall coordination, leaders can formulate a master work plan that maps out the multiple areas in need of improvement and highlights those areas on which different teams are working. Individual improvement plans will then be developed for each area.

It is important to hold managers at all levels accountable for ensuring implementation of action plans and reporting on quality improvement achievements. This is closely linked to the discussion relating to communication and feedback (see section 3.5).

⁷ The baseline audit was done by the Health Systems Trust in 2011 on behalf of the DOH. It focused on the six priorities and a comprehensive facility audit.

⁸ Note: In terms of risk management, mechanisms to identify risks and early warning systems (EWS) are currently being developed. These will also require immediate action.

3.2.3. Developing an improvement plan

It is useful to develop an action plan with timelines and clear accountability. This paves the way for the QI team and ensures that QI meetings result in action. A useful approach to the QI plan is the A3 tool, which is described in the tool section (see section 5.2). Appendix B also provides an example of a QI plan.

3.3. Focus on data

3.3.1. The importance of data in quality improvement

Continuous data collection, analysis and use of the results is an important foundation stone of QI. Data offers insight into the extent of the problem, assists in identifying gaps and enables performance measurement. Data also provides important evidence for improvements in service delivery and health outcomes. Data is a useful mirror, which reflects the health system performance and the client's experience receiving health care.

Data helps teams to answer two important questions in the improvement framework:

- What are we aiming to achieve? (aims/targets)
- How do we know if we have achieved our target? (measure improvements)

All improvement requires change of some sort; however, not all changes result in improvement. Data tells us whether changes have in fact resulted in improvement.⁹

3.3.2. Mapping core assessment data to facility performance and client experience data

There are several sources of data to assess the health establishment's performance and the experience of the client:

- The baseline audit generates an important data set. It is also important to utilise other facility performance data (discussed in box 1 below). These combine to show the situation before the improvement process begins.
- The National Core Standards provide a useful, ongoing assessment tool which assists in tracking progress.

The combination of assessment and facility performance data provides a baseline to track facility performance as improvements are made and standards are attained. This is considered to be the *voice of the system*. This voice tells us how the overall system is performing based on data tracked for each process. In addition, it can contribute to other risk analyses undertaken by management.

- Another important dimension of quality is the *voice of the patient*. The ongoing measurement of facility performance from a patient perspective is crucial in meeting the needs of those whom the system is designed to serve. Patient satisfaction surveys or the monitoring and analysis of complaints can be used as tools to capture this perspective. Measures of patients' service delivery experience include patient rights, waiting times and staff attitudes. There are multiple ways to listen to this voice – patient interviews during the assessment, focus group discussions, observation, or direct involvement of patients in the assessment and/or improvement teams.

In order to do the above effectively, data must be complete, accurate and reliable.

⁹ Langley G. J., R. D. Moen, K. M. Nolan, T. M. Nolan, C. L. Norman, L. P. Provost The Improvement Guide. A Practical Approach to Enhancing Organizational Performance, 2009 Second Edition, p.109

Box 1 – performance data

A note on performance data:

Performance data includes routine data collected at the facility relating to specific services and programmes. For example:

- In a hospital setting, data that could be used to track performance related to patient safety include the number of patient falls, number and type of medication errors or incidents of harm.
- Data elements that track primary health clinic performance could include the number of clients testing for TB, HIV, sexually transmitted infections (STIs), plus the number found positive and referred for treatment.
- Performance data elements within a specific programme, such as prevention of mother to child transmission of HIV (PMTCT), could include, for example, the number of antenatal clients pre-test counselled for HIV.
- Two or more data elements can be combined to form an indicator that is more informative, for example, the number of patients that tested positive for HIV per total number of patients tested per month.

3.4. Focus on systems and process**3.4.1. Understanding and analysing the system**

Once the assessment process has identified gaps the relevant data is analysed. Teams need to understand that gaps are not always the result of individual neglect or fault, but rather a result of poorly designed systems.

An emphasis on systems is central to quality improvement – poorly designed systems generate inefficiency, waste, low quality health care and negative health outcomes. It is therefore important to understand the system and its components – one way to do this is through WHO's health systems framework outlined below. QI can achieve a lot by improving processes and systems using the resources available.

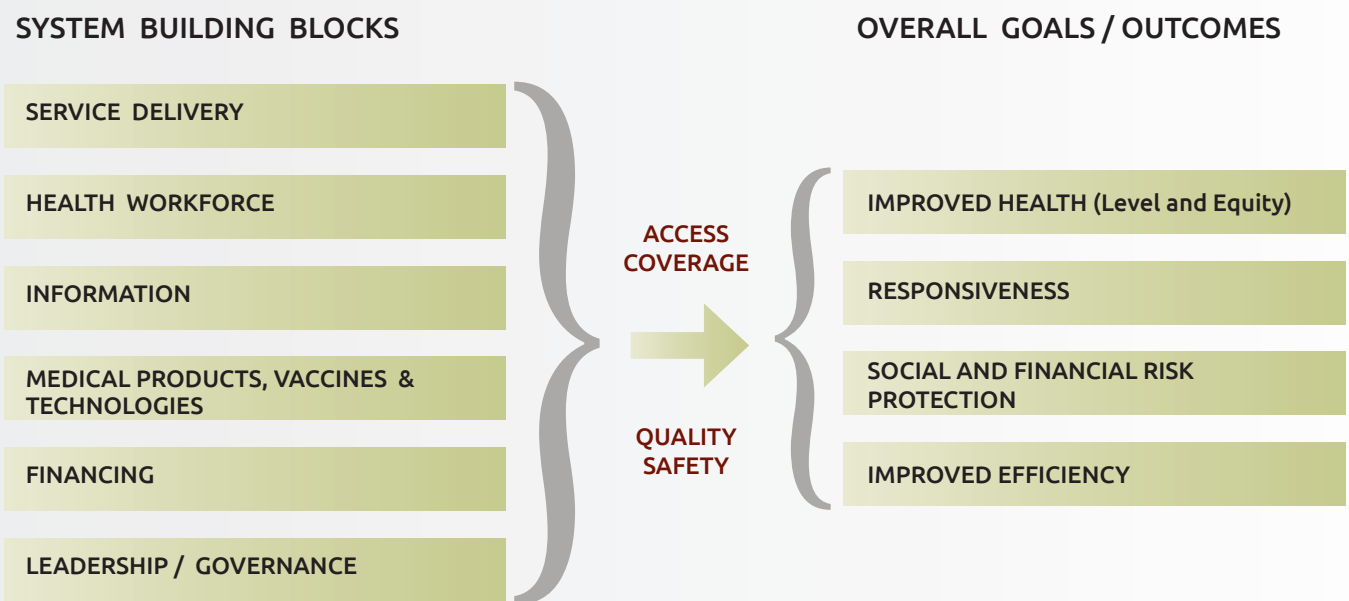
3.4.2. WHO's health systems framework.

WHO provides a useful framework for looking at health systems, which comprises six separate but inter-related building blocks (see figure 7 overleaf):

1. Service delivery
2. Health workforce
3. Information
4. Medical products, vaccines and technologies
5. Financing
6. Leadership/governance

These core building blocks contribute to the health system strengthening in different ways. Some building blocks are overarching and provide the basis for the overall policy and regulation of all the other health system blocks: *governance* and *information systems*. Other building blocks relate to core inputs for the provision of health care: *financing* and *human resources for health*. The final group reflects outputs of the health system: *medical products and technologies* and *service delivery*. Strengthening these building blocks leads to improved health outcomes, improved efficiency, a responsive, client-centred health system, and stronger social and financial risk protection and accountability.

Figure 7: WHO’s six building blocks of a health system¹⁰



3.4.3. Inputs, processes and outputs

A system consists of inputs, processes and outputs that contribute to overall patient outcomes. These terms are defined as follows:

- *Inputs* are those aspects which are required to make the system function.
- *Processes* are a series of activities and tasks (using the inputs) that bring about a specific result. Examples include clinical algorithms (clinical decision-making and processes), information flow processes (the way information is communicated), material flow processes (the process whereby material such as drugs, supplies, food and equipment moves through the system) and patient flow processes (the client’s journey through the health service).
- *Outputs* are the results produced by a particular process.
- *Outcomes* are the end results, which include the overall impact on the health of clients/patients/ community.

¹⁰ (i) WHO Measuring health systems strengthening and trends: a toolkit for countries(draft), WHO 2008

(ii) WHO. Everybody’s business. Strengthening health systems to improve health outcomes. WHO’s Framework for Action, WHO 2007.

QI initiatives ensure that activities, inputs and processes deliver the intended outputs and desired outcomes (see examples in Box 2). Once teams understand this, they are in a better position to identify causes and implement changes that will effect more widespread improvement of the system.

The domains of the National Core Standards reflect such an approach. The layout reflects the core business or key outputs in the first domains; and the processes and inputs to support these outputs in the latter domains. Examples of the application of inputs, processes and outcomes to the National Core Standards, see Appendix C.

Box 2: Some examples of inputs, processes and outcomes

Resources (Inputs) Includes people, infrastructure, material, drugs, information, technology	Activities (Processes) Includes what is done; how it is done	Results (Outputs/Outcomes) Includes health services delivered; change in health behaviour; change in health status; client satisfaction.
Personnel	Admission	Improved health status
Cleaning equipment	Procurement and in-service training	Improved cleanliness
Training	Queue marshals and information relating to waiting times	Satisfied patients
Guidelines/protocols	Treatment	Improved health status
Performance management policies and guidelines	Supervision, mentorship and support	Improved performance; decreased absenteeism

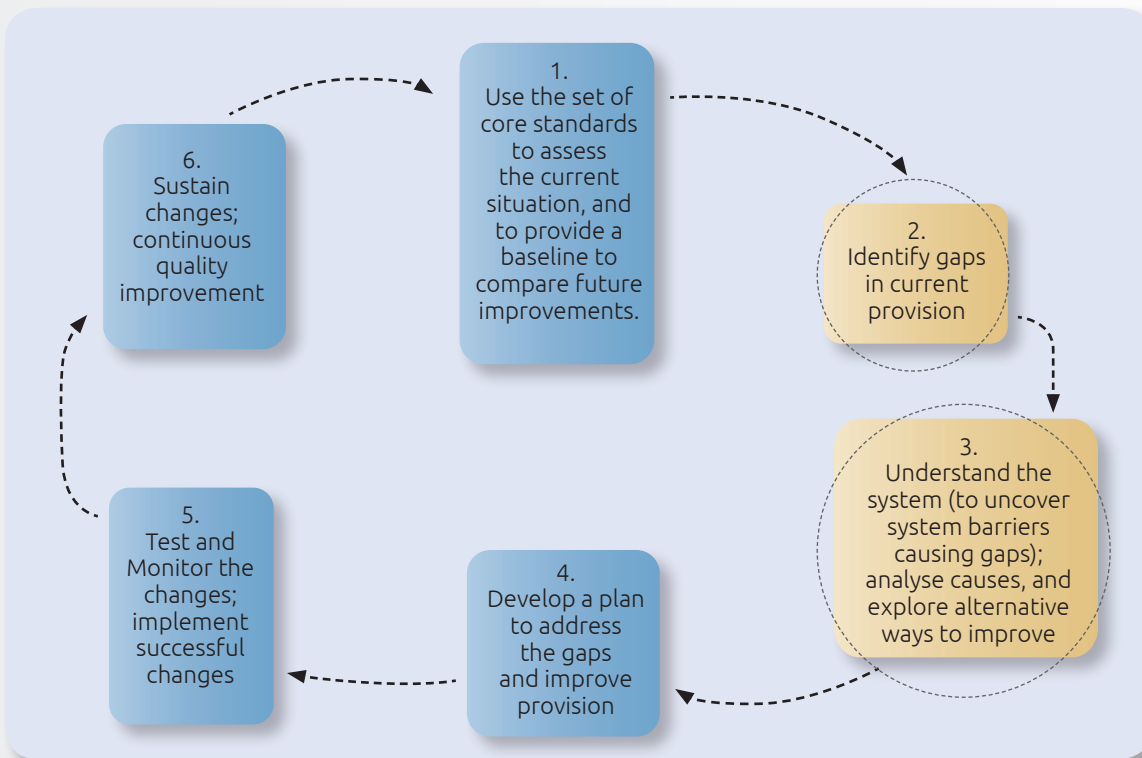
3.5. Communication and feedback

Effective communication and continuous feedback underpin all the foundation stones mentioned above. Effective communication on progress between QI teams, on-the-ground staff, management and leadership is vital for longer term sustainability. Feedback on successes encourages a culture of continuous QI. In addition, communication to clients about QI initiatives increases confidence in the health service and shows clients their opinions and needs are taken seriously. Therefore communication is a vital component of all scale-up efforts.

4. QUALITY IMPROVEMENT TOOLS

There are several tools which are helpful for identifying and analysing problems and gaps. These tools assist with steps 2 and 3 in the QI cycle as outlined in figure 8.

Figure 8: QI as a continuous, cyclical process (Steps 2 & 3)



This and the following sections describes several tools drawn from different QI approaches.^{11,12,13}

Box 3 describes the purpose of each tool. The tools follow a logical sequence, from identifying problems, to analysing causes, to exploring improvement interventions and implementing QI changes. It also includes a tool to plan for improvements and present results (A3 Reports).

Such tools are fundamental for effective QI teams, but in simplified form they are also used more informally by all good managers in the course of their work to get things done.

¹¹ These include, for example, Lean and IHI.

¹² Institute for Healthcare Improvement www.IHI.org

¹³ See for example: Womak JP and Jones: DT Lean Thinking, Second Edition, Free Press, 2003; Toussaint J and Gerard RA: On the Mend, Lean Institute Enterprise, 2010; contact Lean Institute Africa; leaninfo@gsb.uct.ac.za; www.lean.org.za; Lean Institute Enterprise www.lean.org/. An example of the application of Lean Methodology has been provided in Appendix D.

Box 3: Summary and purpose of tools

Section	Tool	Purpose
4.1	Process mapping (also known as flow diagram)	Analysing the system and identifying gaps
4.2	Identifying and assessing waste	
4.3	Root cause analysis (also known as cause and effect or Fishbone)	Analysing possible causes
4.4	'The five whys'	
4.5	Five-S	A philosophical approach and management tool, used to improve productivity, quality and safety
5.1	PDSA/PDCA	An improvement cycle to try out, test, and implement improvements
5.2	A3 Reports	A technique for planning, implementing and reporting on process improvement projects.

4.1. Process Mapping

A useful way of understanding how the current system (or process) works is 'process mapping', also known as a flow diagram.

A process is a series of connected steps or actions to achieve an output, with both a starting and an end point. The process is part of a larger system. Process mapping is often used to represent a patient's care pathway. For example, the admissions procedure, transferring from one unit to the next, getting a child immunised, or getting tested for HIV. These processes all interact with the system as a whole and require inputs along each step in the path.

Process mapping creates a visual tool to analyse a series of activities in order to identify barriers, bottlenecks, duplication of efforts, waste and/or unnecessary steps that are causing problems. A team approach creates an opportunity to bring together different ideas and perspectives from all members involved in the process. It allows a team to identify problems and opportunities to improve.

It also important to understand a process from both the client's and the staff's perspective.

4.1.1. Steps in process mapping

1. Consider a process in your system you wish to analyse based on the results of the baseline audit and assessment process.
2. Gather together representatives of all stakeholders involved in this process.
3. Make sure to look at the *current* process (NOT the ideal) – you can map out the ideal process later and compare with the current process.
4. On individual post-it notes, write down each major step in the process from start to end (one note per step). If you do not have post-it notes, use a large piece of paper (flip chart is preferable), draw boxes and write each major step in a box.
5. Identify *who* does *what* task in each step and list below the major steps.
6. Arrange steps in order (but feel free to add new steps or re-arrange the order as you go) and connect each step with a line and arrow to denote where to go from each step.
7. Focus on the way things work most of the time.
8. Include every stakeholder in the exercise, respect all contributions and encourage healthy debate.

4.1.2. Analysing a process map:

Analyse the process from the *patient's* perspective:

- How many steps are there for the patient?
- How many times is the patient passed from one person to another?
- What is the approximate task time for each step?
- What is the approximate wait time between each step?
- How many steps add no value for the patient?
- Where are the problems for patients?

Analyse the process from a *resource* perspective:

- Who is responsible for each step?
- Is it being done by the most appropriate person?
- What are the inputs and resources required along each step?
- Where is the wastage (see notes below)?

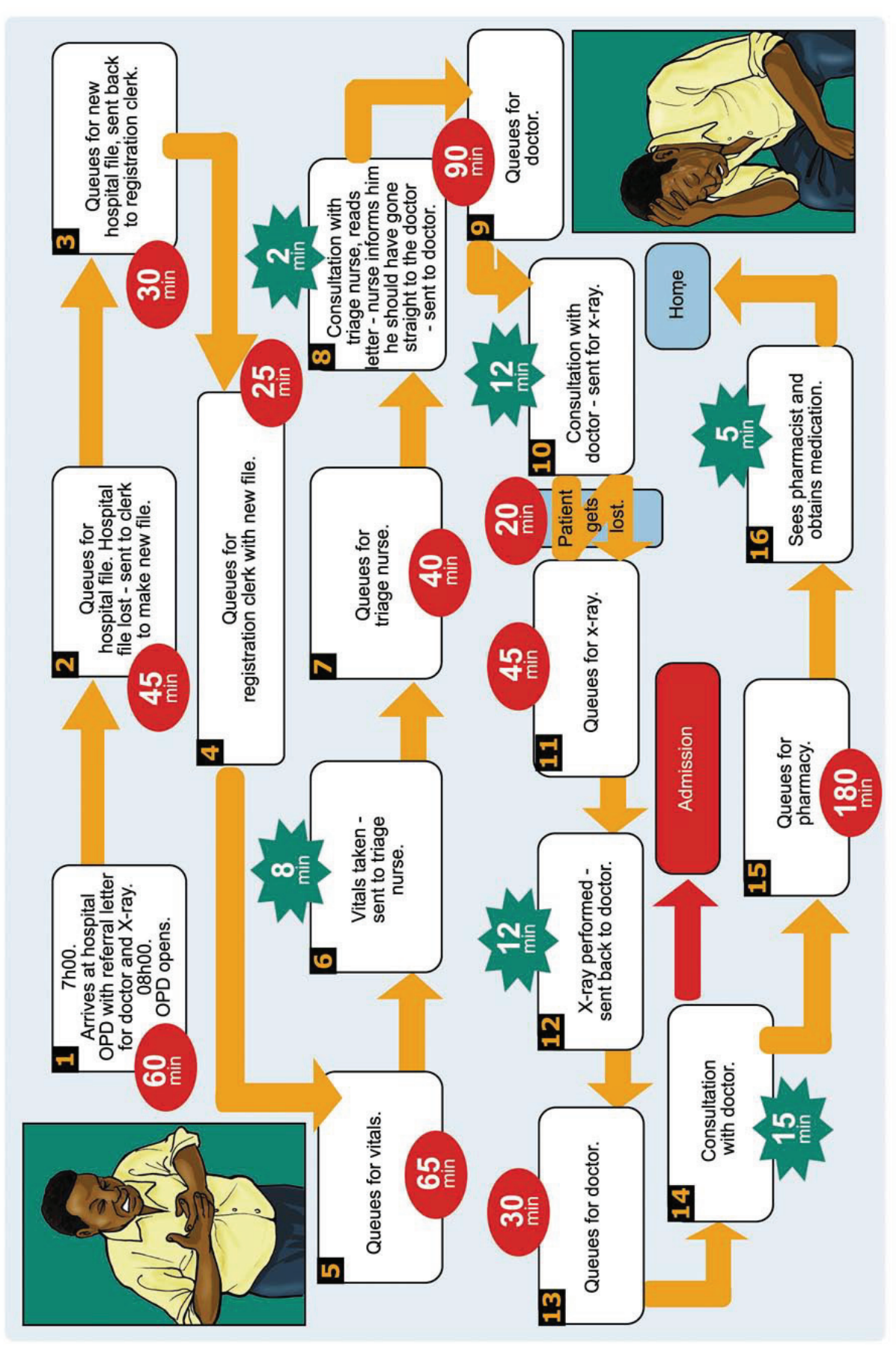
4.1.3. Checklist of questions to ask when analysing a process map

For each step, ask the following:

- Can any step or component be eliminated?
- Can the process be done in some other way?
- Can it be done in a different order?
- Can it be done somewhere else?
- Can it be done in conjunction with another process?
- Can any *bottlenecks* (places where people wait) be removed?

The example in figure 9 shows a process map for waiting times, after which are some discussion points to note in relation to the example.

Figure 9 – Sample process map



4.1.4. Notes on Figure 8 sample process map

Mr Jacobs has been referred from a primary health clinic for an x-ray for chest pains.

He arrives at the hospital at 07h00 and departs at 18h24. He spends 11 hours and 24 minutes at the hospital.

Out of the 11 hours 24 minutes, he spends 54 minutes (3.6%) of his time with various health care providers. 10 hours 10 minutes are spent waiting at service points.

Summary of time spent with health care providers	
Vitals nurse	8min
Triage nurse	2 min
Doctor	12
x-ray	12 min
Doctor	15 min
Pharmacist	5min
TOTAL	54 min

From the point of entering the hospital to leaving, Mr Jacobs goes through 16 steps.

The following are possible areas for quality improvement interventions:

- Mr Jacobs arrived at 07h00 to try and beat the queue. An appointment system may assist in reducing the early morning bottleneck.
- **Steps 2,3,4** – Improve recordkeeping storage and retrieval, he had to queue for his file (45 min, **step 2**) queue for a new file to be opened (30 min, **step 3**) and then return to the reception area to register the new file (25 min, **step 4**).
- He had a referral for the doctor, so the system for triage could be improved. He queued 40 min for the triage nurse (**step 7**), saw her for 2 min (**step 8**) who told him he should have gone straight to the doctor – patients with referral letters can be fast tracked, without going through the triage system.
- **Steps 5-8**, with a combined waiting time of 1 hour **45 min** for vitals and triage, need to be looked at in terms of replication, unnecessary queuing, and combining vitals with triage)
- He got lost going to the x-ray department (between **steps 10 and 11**) and was directed to the wrong unit. Signage could be improved.
- A focused look at the x-ray department to look at how the system may be improved may yield improvements to the waiting time (45 min, **step 11**).
- His return to the doctor with his results could be expedited, so that he does not have to queue again.
- The queue of three hours for the pharmacy (**step 15**) needs to be analysed and improved – subsystems of dispensing, packaging, new prescriptions and repeats etc.

4.1.5. Using the core standards with process mapping

In order to attain the quality of care defined by the core standards, teams can map out the standard (or set of standards) that directly correspond to the steps in the patient’s care pathway. This will guide teams to develop improvement plans, which are aligned to key standards or priority areas in need of urgent intervention. For example:

- Standards related to infection control can be linked to several steps in a patient’s journey to access treatment (e.g. antiretroviral therapy) and teams can focus on these steps when creating improvement plans for non-compliant infection control measures.
- A queue marshal may be needed along key steps of the patient care path but currently is only being used at the facility entrance. Teams can identify bottlenecks and expand the work areas of the queue marshals.
- Furthermore, the analysis can help identify a range of quality issues, such as areas where patients may become lost or frustrated, thereby providing clues as to why a health facility may be non-compliant with key standards related to access or patient rights.

As in the patient care pathway in figure 8, potential bottlenecks, failures or wastages have been identified in order to improve patient care and safety.

4.2. Analysing waste

Identifying waste as a part of the current system analysis is important in understanding which steps add value to the patient process and which do not. Using process mapping or a fishbone diagram (see below) can help identify where waste or delays occur – this is an important step to complete before initiating the improvement process. Examples of waste are provided in Box 4 below:

Box 4: Examples of waste

Waste	Symptom	Example
Waiting for processes	<ul style="list-style-type: none"> • Long length of hospital stay 	<ul style="list-style-type: none"> • Medically fit patient waiting to go home
Mistakes	<ul style="list-style-type: none"> • Clinical incidents • Complaints 	<ul style="list-style-type: none"> • Post-operative wound infection • Drug error • Patients admitted in wrong wards
Transportation	<ul style="list-style-type: none"> • Unnecessary movement of patients, documents and materials 	<ul style="list-style-type: none"> • Ambulance transporting patients with minor injury to Accident and Emergency department • Specimen transported to centralised laboratory for processing
Unnecessary movement/motion	<ul style="list-style-type: none"> • Excessive walking 	<ul style="list-style-type: none"> • Poor layout of working environment
Inappropriate processing	<ul style="list-style-type: none"> • Duplication 	<ul style="list-style-type: none"> • Multiple date entry on information systems which do not communicate • Making several admission files of one patient due to lost files

4.3. Root Cause Analysis (Cause and Effect/Fishbone)

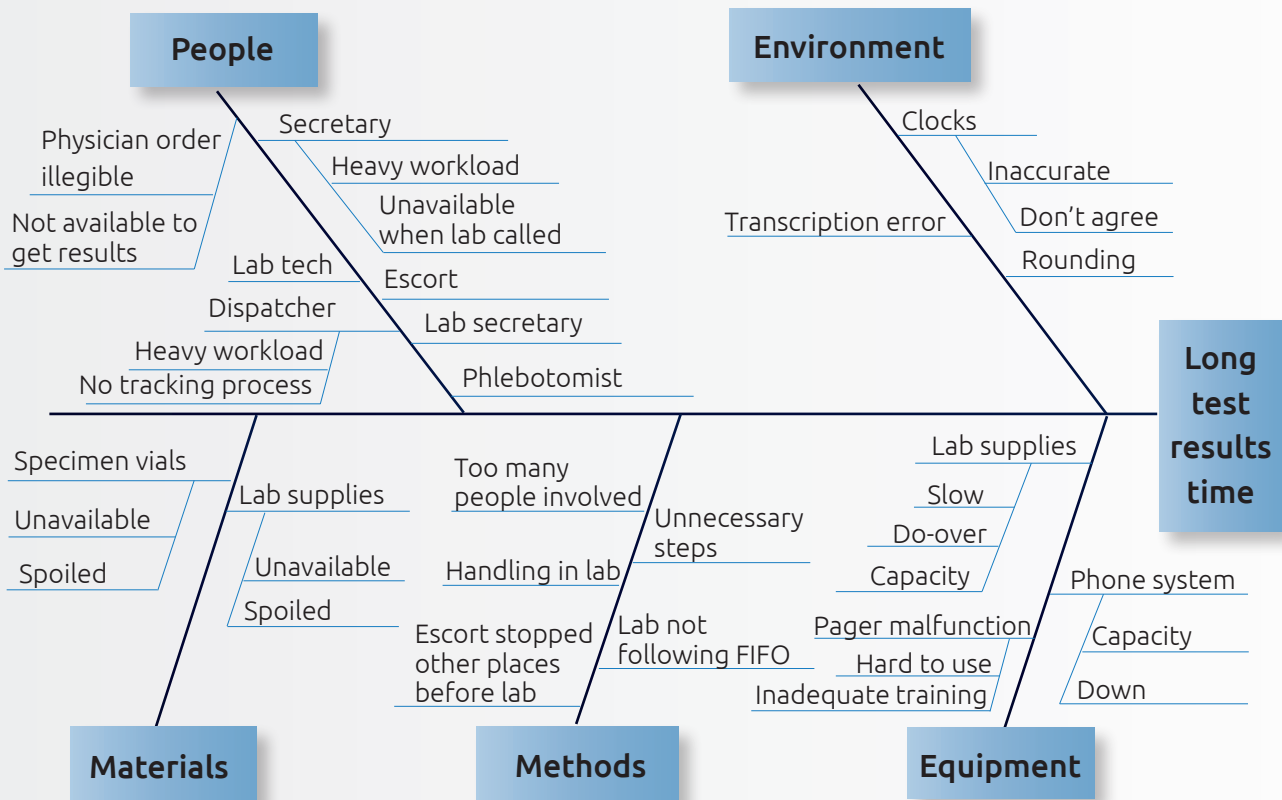
Once a problem is identified, the team should explore underlying causes and identify potential solutions or changes to improve the system. The cause and effect diagram or fishbone (figure 10) is a pictorial display listing a problem with its associated causes. It also enables the team to see how causes relate to, and impact on one another.

After identifying all the causes, the team can decide which are more important and should be examined more closely. Those causes that will gain maximum impact using minimal or no added resources can be addressed first. The main (presenting) challenge is written at the head of the fish. The smaller boxes/bones of the fish represent broad areas which could cause the weakness or challenge. The lines next to each box provide space for further analysis.

Teams use this layout to brainstorm and identify a range of potential causes. Teams then prioritise which causes they will address and generate a list of possible ideas/solutions to address them.

Figure 10: Example of a cause and effect diagram (fishbone) – long test results time from the laboratory¹⁴

Cause and Effect Diagram: “Fishbone”

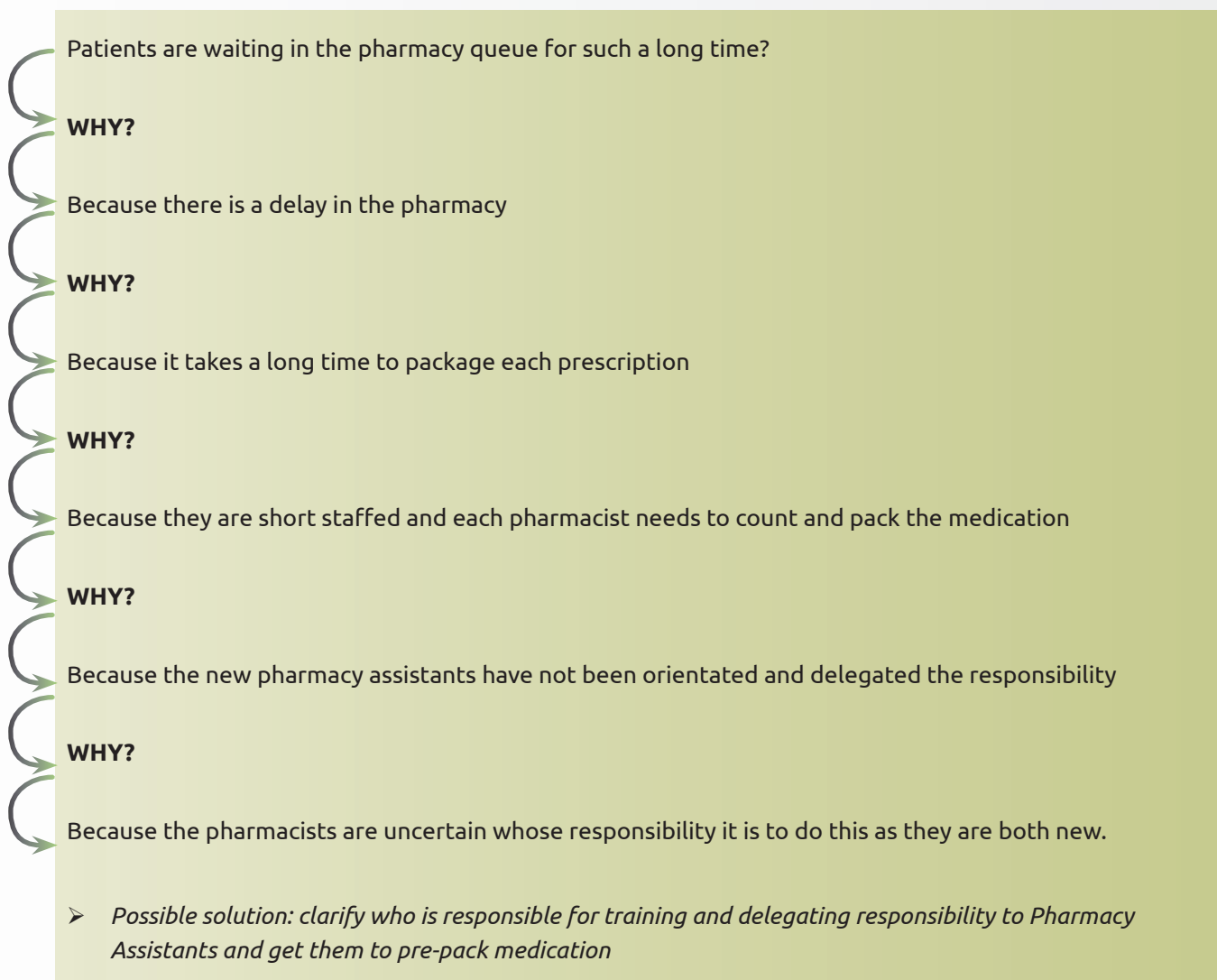


¹⁴ With acknowledgement to IHI for the example

4.4. Ask why five times – The 'five Whys'

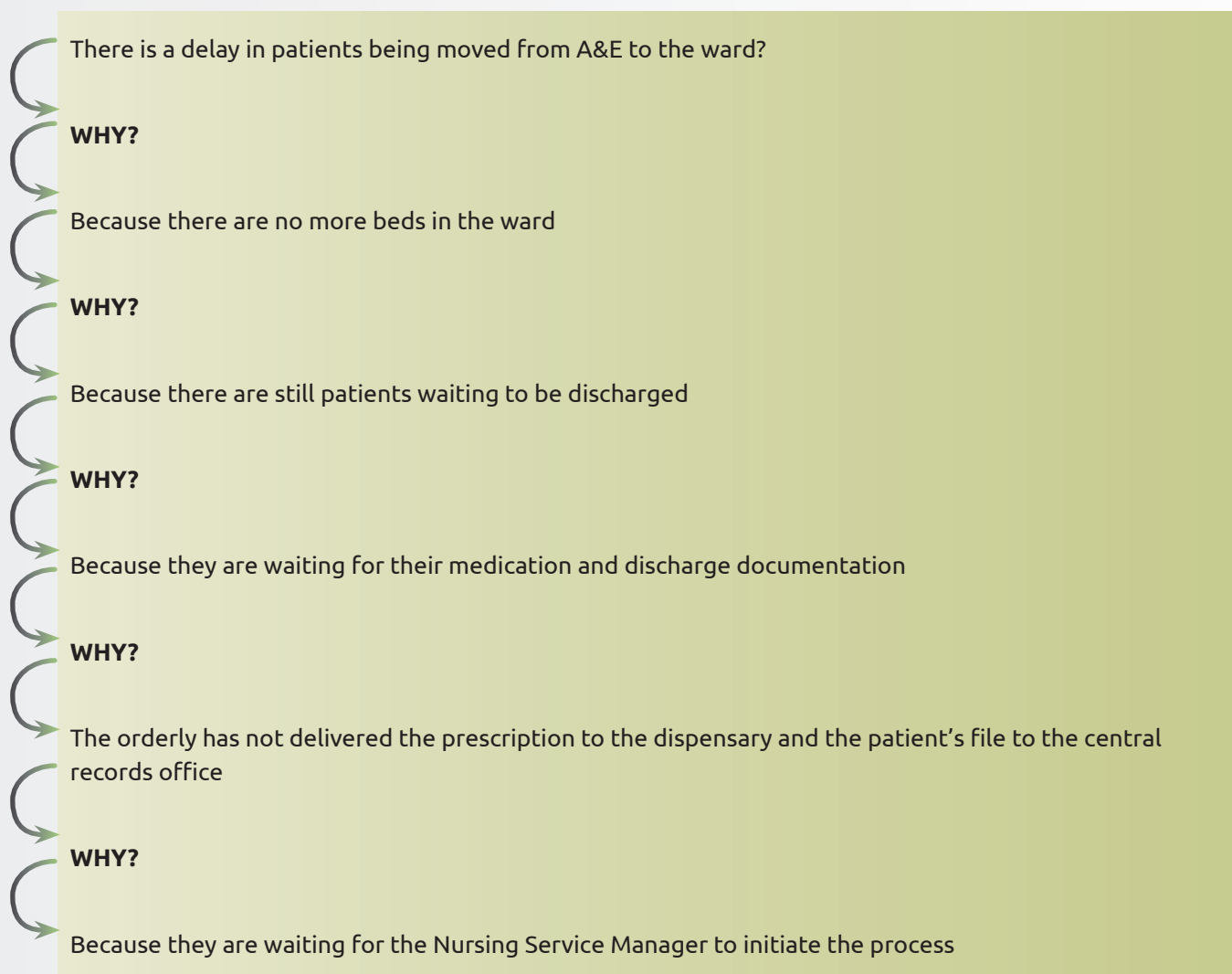
In contrast to the fishbone, which is used to gather all possible causes for a problem, 'Ask-why-five-times' (or the 'five whys')¹⁵ is a technique for probing deeper into the causal chain. The technique tries to identify the root cause more rigorously, which is sometimes different to the initial, assumed cause. Below are some examples:

- **Example 1: The pharmacy queue is unreasonably long. The assumed cause is because there are too many patients.**



¹⁵ NHS Institute for Innovation and Improvement (2008): Quality and service improvement tools –Root cause analysis using the five whysSource: http://www.institute.nhs.uk/creativity_tools
Massoud et al: A modern paradigm for improving healthcare quality. QA Monograph series 1(1) Quality Assurance Project 2001

- **Example 2:** There is a long delay for patients to be admitted and transferred from Accident and Emergency into the ward. The assumed cause is that there is a shortage of beds.



- *Possible solution: Delegate responsibility to the Ward Supervisor/matron in charge to initiate the process and follow up.*

4.5. Five-S (5-S)

Five-S¹⁶ is both a philosophical approach and a management tool, used to improve productivity, quality and safety. It is one of the core Lean tools (from Lean improvement methodology) and focuses on maintaining a clean and orderly workspace. The 5-S approach encourages the involvement and discipline of all employees. It is a useful overarching quality improvement tool to organise and manage the workspace, improve workflow and eliminate waste.

Five-S is derived from Japanese and can be summarised as follows:

Box 5: 5-S

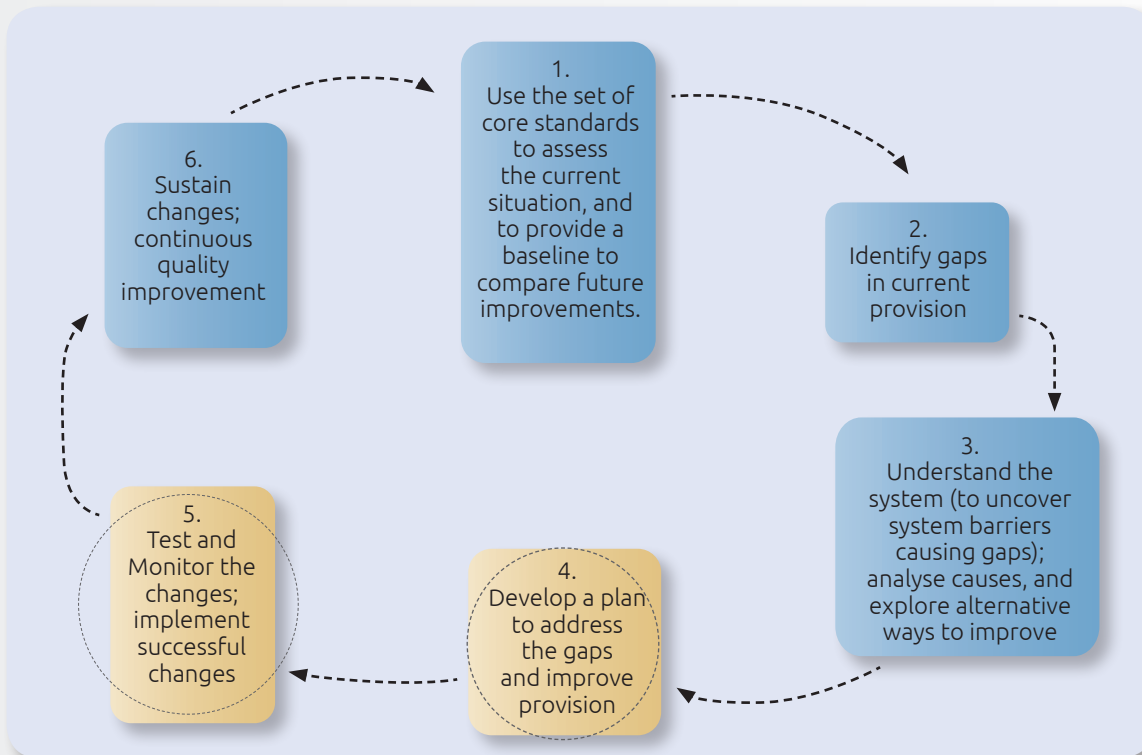
5-S	
Sorting (seir)	Remove unused items from the workspace
Set in order (seiton)	Organise all necessary items in their correct place for easy, swift access, and efficient services provision
Shine (seiso)	Maintain a clean environment
Standardise (seiketsu)	Set up Sort, Set and Shine as norms in every section of the health facility and in all workstations (including wards, examination rooms, waiting rooms, offices,; storerooms and service centres e.g. laundry; outside areas)
Sustain (shitsuke)	Reinforce the importance of the 5-S approach and the sustained discipline and commitment of employees

¹⁶ Hirano H. 5 pillars of the visual workplace: the source book for 5S implementation, 1995

5. TESTING CHANGES AND IMPLEMENTING IMPROVEMENTS

Once problems and gaps have been identified, the next step is to identify and test ideas generated by the teams, and if successful, implement the improvements. This links to steps 4 and 5 in the improvement process (see figure 11). Change should initially be carried out on a small scale to test whether the intervention actually results in an improvement, before implementing across the system. The fundamental idea is that, without testing, one does not know if the improvement will actually make the situation better. Changes are tested by developing a detailed plan known as the PDSA (Plan-Do-Study-Act) model¹⁷ for change. If used correctly, this methodology helps close the gap between the current state (the assessment result) and ideal state (the standards).

Figure 11: QI as a continuous, cyclical process (Steps 4 & 5)



5.1. PDSA Cycle

There are three critical questions which guide the PDSA cycle of improvement:

- **What are we trying to achieve?**
Teams should formulate specific targets or aims that they hope to accomplish (what, how much and by when)
- **How will we know when a change is an improvement?**
Teams use quantitative measures (data) to determine if a specific change actually leads to an improvement (and reaches the target)
- **What change can we make that will result in improvement?**
This is determined by trying, testing, and using data to assess the results.

¹⁷ Langley G.L. Nolan K.M. Nolan T.W. Norman C.L. Provost L.P. The Improvement Guide: A Practical Approach to Enhancing Organisational Performance, 2009

The above three questions form the basic framework for teams developing improvement plans to address gaps identified in the core standards and to improve the health establishment’s performance. Once these questions have been answered, action needs to be taken on how best to deal with the identified gaps.

A useful approach to identifying actions is the PDSA cycle – a process whereby interventions are tested and adapted to make improvements. This is also known as Plan-Do-Check-Act (PDCA) in Lean methodology.^{18,19}

The PDSA cycle of improvement is a model for testing a change in the real work setting – by planning, implementing and analysing the results, and acting on what has been learned.

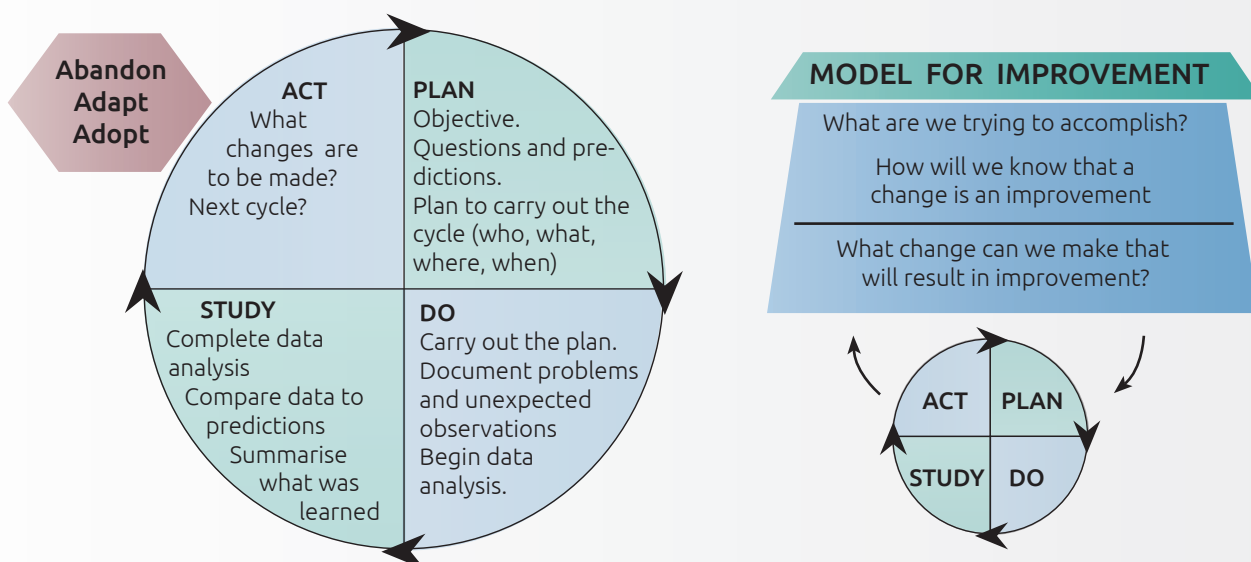
PDSA is an evidence-based, systematic method adapted for action-oriented learning: starting with a plan and ending in an action based on learning gained.

The Model for Improvement is made up of a set of three fundamental questions that drive all improvement combined with the PDSA cycle²⁰, as shown in Figure 12 below:

A good PDSA cycle should:

- clearly identify the system failure (related to the standard) being targeted for improvement.
- include specific ideas for change, including answering the following questions: What is the change? Who will test the change? Where will they try it? How will it be done? When will it be tried?
- display what data is required to assess whether the change (i) resulted in improvement, (ii) resulted in no improvement, or (iii) made the situation worse.

Figure 12: The PDSA Cycle and the Model for Improvement²⁰



¹⁸ See for example: Womak JP and Jones: DT Lean Thinking, Second Edition, Free Press, 2003; Toussaint J and Gerard RA: On the Mend, Lean Institute Enterprise, 2010; www.lean.org.za; www.lean.org

¹⁹ Moen, R.D. Norman, C.L. Circling Back: Clearing up myths about the Deming cycle and Seeing How it Keeps Evolving, Quality Progress, American Society for Quality, November, 2010

²⁰ Langley G.L. Nolan K.M. Nolan T.W. Norman C.L. Provost L.P The Improvement Guide: A Practical Approach to Enhancing Organisational Performance, 2009 pp.23-24

5.1.1. Explaining the cycle: Plan, Do, Study Act

‣ Plan

With any new idea for change, an improvement plan needs to be developed. The plan should detail who is involved in testing the idea, what is being tested, where this will take place, when it will be done and how the test will be done. Details about the data required to measure the change should also be outlined (the target, the data that needs to be collected, by whom, and the process to study the results). Tracking this data will reveal whether the change results in an improvement. Although baseline data has already been collected during the assessment, further data may be required from service points. The plan needs to clarify the length of the testing period and the responsible person/s. This test of change is meant to be designed on a small scale – for example, testing the change on one day with a small group or patients.

‣ Do

The change is then tested – the plan is implemented to address gaps with the aim of improving care and safety. Any unexpected observations, problems and successes should be recorded. Any recognised change (positive and/or negative) is documented and all data is captured for analysis and interpretation during the study phase.

‣ Study (or Check)

The team analyses the results and summarises what they have learned. During the testing, it is important to continuously monitor and record the outcomes. Each task team and team leader should take responsibility for recording all activities, data and results so effective analysis can take place. The team will reflect on progress and compare it with initial baseline, assessment or performance data. Positive results that contribute to improved care and safety of patients should be encouraged and praised. Negative results, where change has not taken place, should be documented for learning and analysis during the next step.

‣ Act

Based on the test findings, the team will decide whether the changes/plan should be adapted, abandoned or adopted. The change will be adapted to achieve better results, abandoned if the results were negative, or adopted as potential new practice if the results were positive. In some instances, a new plan, with a different idea for change will need to be developed to better address the gaps. And so the cycle of improvement is restarted.

After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team should implement the successful change on a broader scale – for example, for an entire patient group. This links to sustainability and scale-up, which is discussed in Section 6.

5.2. A3 Reports

A3 reports are a technique for planning, implementing and reporting on process improvement projects. This type of report derives its name from the fact that all the essential project information is recorded on one A3 size page. The A3 report²¹ encourages improvement teams to be clear and concise, by requiring them to think through and represent the entire improvement process on one piece of paper. This format makes it easier to monitor and display, and people are more likely to use it because it is brief and to the point. A sample is provided in Figure 13.

²¹ Acknowledgments to Lean for the use of this information: contact Lean Institute Africa; leaninfo@gsb.uct.ac.za; www.lean.org.za

Lean methodology uses the PDCA (Plan, Do, Check, Act) cycle, which focuses on “check” rather than “study” in ensuring change is an improvement.

The left-hand side of an A3 report is the P in the PDCA cycle. An A3 report usually starts with a concern about inadequate performance which is reflected in the title block. The issues relating to this problem are summarised in the background block. The current condition block contains text, measurements and diagrams describing the state of the problem before improvement. Thereafter a measurable target for the improvement project should be set. Most of the planning time should be spent on the root cause analysis to make sure the reasons for the problem are correctly identified.

The right-hand side represents the DCA part of the PDCA cycle in the form of a simple project plan to implement the improvement recommendations. It is advisable for the A3 owner to review the report at least once a week with their manager. The manager should help the A3 owner to identify recommendations that will address the root causes of the problem and to remove any obstacles to implementing the recommendations.

Figure 13: A3 Reports²²

Project Name:		Updated on:							
Regular Meetings on:		Next meeting:							
Title:	What is this about ?								
Background	<ul style="list-style-type: none"> Background on the problem Context required for full understanding Importance of the problem 								
Current Condition	<ul style="list-style-type: none"> Process diagram of current situation (attach if too big) Highlight the problem on the PFD Measurement (s) showing the extent of the problem Add graphs, diagrams if necessary What about the process is not working as customers require? 								
Goals	<ul style="list-style-type: none"> State the specific target (s) in measurable or identifiable terms Define how to measure critical tasks and processes 								
Root Cause Analysis	<ul style="list-style-type: none"> Identify key problem symptoms & do separate fishbone analysis for each Find most likely root causes by using “Ask Why 5 times” or other technique 								
Project Owner:		Facilitator:							
Team Members:									
Target Condition	<p><i>Recommended Corrective Actions</i></p> <ul style="list-style-type: none"> Process flow diagram of proposed new process (attach if too big) List of recommendations to improve performance <p><i>Performance Targets</i></p> <ul style="list-style-type: none"> Set measurable targets for issues identified earlier 								
Implementation Plan	<table border="1"> <thead> <tr> <th><i>What, How & Where ?</i></th> <th><i>By Who ?</i></th> <th><i>By When ?</i></th> </tr> </thead> <tbody> <tr> <td>• Actions to be taken</td> <td>Responsible person's name</td> <td>Dates, time</td> </tr> </tbody> </table>			<i>What, How & Where ?</i>	<i>By Who ?</i>	<i>By When ?</i>	• Actions to be taken	Responsible person's name	Dates, time
<i>What, How & Where ?</i>	<i>By Who ?</i>	<i>By When ?</i>							
• Actions to be taken	Responsible person's name	Dates, time							
Follow-Up	<table border="1"> <thead> <tr> <th><i>Plan</i></th> <th><i>Actual Results</i></th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> How will you check the results? When will you check them? </td> <td> <ul style="list-style-type: none"> Date check done Measurement after implementation Pictures of improvements </td> </tr> </tbody> </table>			<i>Plan</i>	<i>Actual Results</i>	<ul style="list-style-type: none"> How will you check the results? When will you check them? 	<ul style="list-style-type: none"> Date check done Measurement after implementation Pictures of improvements 		
<i>Plan</i>	<i>Actual Results</i>								
<ul style="list-style-type: none"> How will you check the results? When will you check them? 	<ul style="list-style-type: none"> Date check done Measurement after implementation Pictures of improvements 								

5.3. External compliance inspections

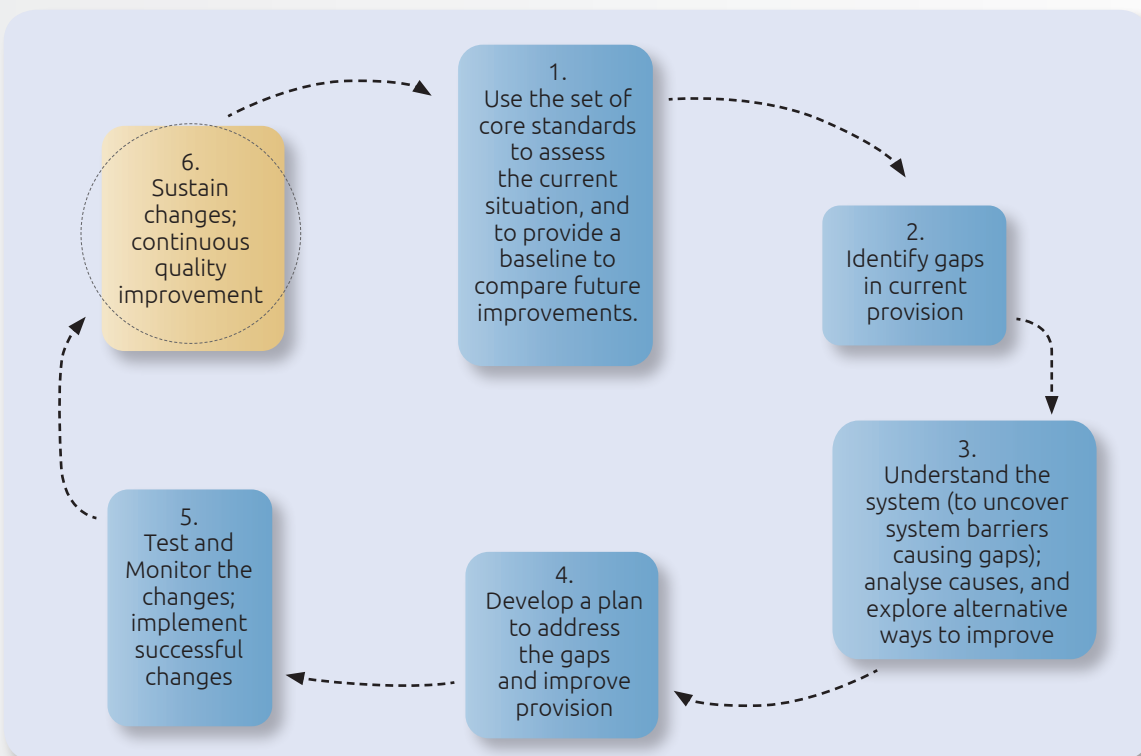
In the long term, periodic external inspections by the future Office of Health Standards Compliance will provide a summary assessment as to whether all the actions taken resulted in the health establishment meeting prescribed standards and norms.

²² Acknowledgments to Lean for the use of this information: contact Lean Institute Africa; leaninfo@gsb.uct.ac.za; www.lean.org.za

6. SUSTAINING QI AND SPREADING CHANGE

This section discusses how to sustain and spread both QI and successful improvement interventions step 6 of the QI cycle (see Figure 14). It is vital that scale-up preparations are planned from the beginning. This will help ensure that QI is not implemented in the form of small, separate projects, or one-off events, but as part of a larger health systems QI strategy.

Figure 14: QI as a continuous, cyclical process (Step 6)



6.1. Sustainability

Once teams have improved processes and performance, and eliminated gaps in areas of non-compliance, sustaining these improvements is critical. Sustainability²³ is about continually recognising improvements, monitoring progress and building on successes – to ‘hold the gains’ well after improvements are made. Sustainability requires both staff and management to have the capacity to sustain changes that have led to improvements in quality and safety as well as overall health. This needs to become part of their routine work.

The ultimate result of sustaining these changes will be not only a shift in mindset, attitude and practice by all staff members but a transformed system. New practices become the norm and revised policies and procedures are put in place to support this transformation. It is critical that teams and leadership ensure that staff do not revert to old practices or broken processes are not reverted to. Upholding standards is an ongoing process and the five foundation stones or principles should form part of a standard management approach. Additional guidance on sustainability is listed in Appendix A.

²³ For further reading, Sustainability - www.institute.nhs.uk/sustainability

6.2. Spreading Changes – models for supporting rapid spread and scale-up

After successful implementation of a change, or multiple changes, for a pilot population or an entire unit, the team can spread the changes to other parts of the organisation or across other organisations.

It is important to remember that all South African health establishments will be working to meet the core standards and provide improved care – individual facilities are not alone in this endeavour. During this process, creating a support system for facilities across a district to work and learn together could be beneficial. Some examples of this collaborative model include the IHI Breakthrough Series Learning Collaborative model (BTS).²⁴ Examples of using the BTS in South Africa are the PMTCT 20,000+ project²⁵ and the Best Care Always Campaign.²⁶

A 'learning collaborative' is designed to help organisations involved in quality improvement support, share and learn from each other, and where necessary, learn from recognised experts. It is typically a short-term learning system that brings together a large number of teams from hospitals and clinics to seek improvement in a focused topic area.

Improvement teams from participating health establishments gather together at workshops every four to six months to learn how to use specific QI methods and set common improvement aims. Between these workshops, teams apply the skills learned at their respective facilities. Local solutions are developed and then shared and spread to other facilities at the collaborative workshops. See figure 15 for a visual representation of a collaborative or learning network.

This collaborative model can be used to bring together health establishments across a district to improve performance gaps and work together throughout the 'cycle' of quality assessment, improvement, and re-assessment. Teams could work their way through specific vitals, domains or key priorities identified in their district.

By working together, peer-to-peer learning is enhanced, ideas and tools are shared and spread more quickly, learning from failures and successes is increased, and facilities feel a sense of support. The key to these networks is the creation of shared aims and goals that are driven by the continuous use and analysis of facility performance and self-assessment data.

Teams working in these 'collaboratives' have achieved dramatic results – for example reducing waiting times by 50%, reducing worker absenteeism by 25%, reducing intensive-care unit (ICU) costs by 25%, and reducing hospitalisations for patients with congestive heart failure by 50%²⁷.

²⁴ The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement; 2003. (Available on www.IHI.org)

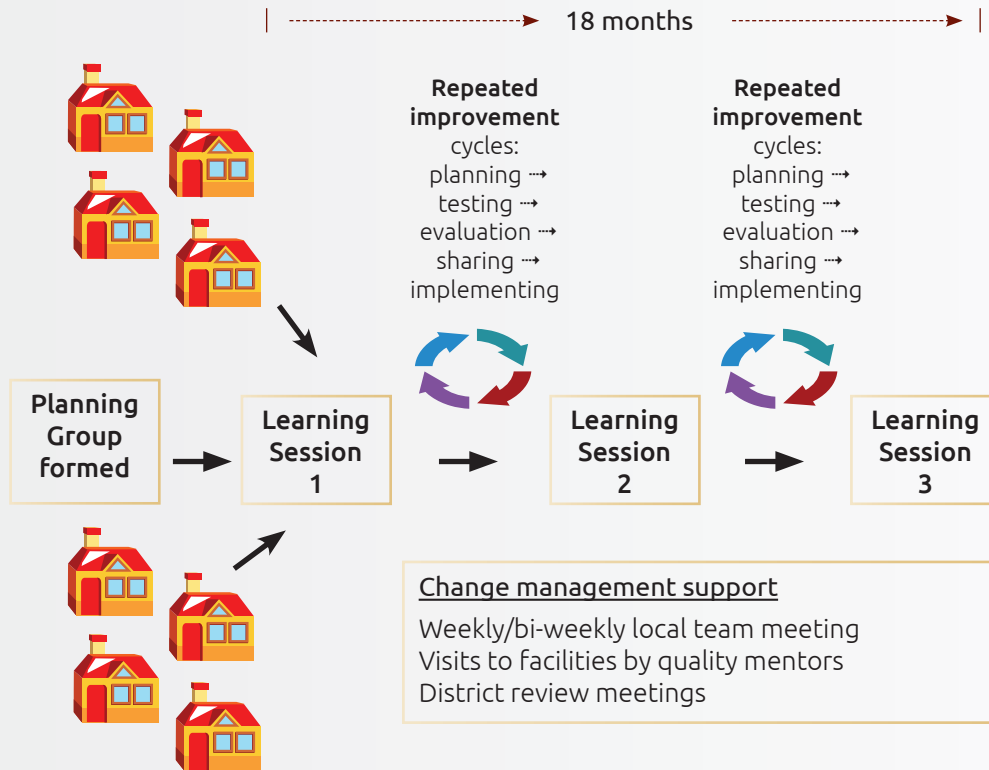
²⁵ For further information see www.mspsouthafrica.org

²⁶ For further information see <http://www.bestcare.org.za/>

²⁷ The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement; 2003. (Available on www.IHI.org)

Figure 15: The learning network – the improvement model

LEARNING NETWORK: IMPROVEMENT MODEL²⁷



Lean methods advocate a similar approach, called a ‘college’ to emphasise the required action learning. In the college approach, staff from a group of institutions are seconded to, or actively participate in QI teams, which use process mapping and 5-S processes. Working collaboratively helps to train people in QI methods and to enable their spread.

²⁷ The Breakthrough Series: IHI’s Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement; 2003. (Available on www.IHI.org)

7. QUALITY IMPROVEMENT SUMMARY

In summary, quality improvement can be seen as...

- a rapid, logical method for identifying critical gaps in the health care system through a process of self-assessments and a review of results and monitoring.
- a method for creating improvement aims for health establishments (what to improve, and by when), generating ideas to change the system/process, and planning how to measure change and if change resulted in improvement.
- a method for promoting continuous measurement to sustain or accelerate improvement.
- a way to engage front-line teams and tap into local knowledge and ideas for problem solving and action-oriented planning.
- a way to share and learn best practices across teams and between different facilities.

Quality improvement...

- is best achieved by those working at the health establishment *site* (or a department therein) with the *support of management* and the *health systems infrastructure* which supports service provision.
- requires a *team approach* – it will not succeed through the efforts of one individual alone.
- is an *ongoing process* – it is not achieved through a one-off action or training, but should be done on a continuous basis, as part of the staff general work cycle and based on the assumption that quality can always be improved.
- needs to be part of any good manager's day-to-day work.

For sustained, effective quality improvement management needs to...

- establish QI teams and clarify roles and responsibilities of team members.
- ensure the development of QI plans with specific targets and timeframes – for example, setting a target and completion date by when non-compliant vitals should be addressed.
- support the implementation and management of quality improvement activities.
- support the team in prioritising interventions.

For sustained, effective quality improvement teams need to...

- identify gaps, analyse problems and test proposed changes and innovations using QI tools.
- share change ideas, successes and experience through existing internal meeting forums and learning networks at the sub-district/district level.
- collect, compile, validate, analyse, utilise and ensure timely submission of quality improvement reports to the health establishment's management and quality coordinators.
- ensure actions are taken by management to correct weaknesses.

APPENDICES

Appendix A:

Sustainability through continual improvement and the institutionalisation of change

Appendix B:

Samples of a quality improvement plan

Appendix C:

National Core Standards: Examples of inputs, process and outcomes

Appendix D:

An example of the application of Lean Methodology – Hospital OPD Pharmacy Improvement Project

APPENDIX A: Sustainability through continual improvement and the institutionalisation of change²⁸

The following is an extract from: *The Five steps to Quality Improvement: A facility based guide to improving clinical outcomes and quality mentorship*. Institute for Healthcare Improvement, Department of Health, University of KZN/20,000+

Sustainability through continual improvement and the institutionalisation of change

Aspects of sustainability

- The care pathway targeted has been transformed; old ways of accomplishing tasks are no longer an option for new or incoming staff members.
- Quality improvement as a value is respected and facilitated by senior leaders at your facility, with leaders asking and engaging in what will be improved next.
- The QI Team at your facility is no longer reliant on the 'Improvement Leader' ... but all members are capable of taking the team forward if one member moves on to a new opportunity.
- Data, through annotated run charts, are used to make key management decisions by facility leaders, and are understood, respected and utilised by staff members.

'How to' engage in continual improvement

- As a team, work sequentially through the care pathway you have targeted for improvement.
- Start at the beginning, establish baseline performance and establish barriers to care.
- Using your Change Package (this refers to other documents in the 20000+package), or ideas generated internally, test change ideas for improvement using multiple PDSA cycles.
- As clinical performance improves, reflected by data shown on your run charts, move from step to step in the care pathway.
- When the team has worked through the entire care pathway, evaluate how far the team has come and how much clinical performance has improved. Re-evaluate the aims set at the beginning of the improvement process.
- If needed, go back to the beginning, setting more ambitious aims and starting at the beginning of the care pathway again, looking for new challenges and new solutions.
- If the care pathway targeted requires no further improvement, evaluate the value of applying these lessons to a new care pathway in your facility.

²⁸ Source: *The Five steps to Quality Improvement: A facility based guide to improving clinical outcomes and quality mentorship*. Institute for Healthcare Improvement, Department of Health, University of KZN/20,000+

'How to' institutionalise change

- Meet together as a team to review the success of a given change you have tested and have decided to implement in your facility.
- Review all relevant data providing your team with evidence that the change you have made has resulted in an improvement. Come to a consensus on the value of change implemented.
- As a team, develop a standard operating procedure (SOP) that defines the new way of working within the care pathway. This SOP can act as a reference to how things should be accomplished in the future regarding the standard of care in your facility.
- As new staff join your facility, train them according to the SOPs developed as a result of the improvement process you have engaged in. This will effectively eliminate the 'old way' of doing things.
- As new staff join your facility, cycle them onto the Improvement Team, exposing them to your improvement process and creating in them an ability to continue to improve the health system they now work within.

'How to' maintain and sustain the improvement process

At the end of the intensive phase, the team should have developed all the key skills needed to run improvement meetings independently with regular (though less frequent) monitoring and input from the Quality Coordinators. Facility-level improvement meetings should now continue on whatever schedule the team chooses but should happen at least every two weeks. As the Quality Coordinator, you should help the facility Improvement Team to plan the next two or three meetings. If you are comfortable with the performance of the facility, move on to monthly visits for the next three months and then review progress.

APPENDIX B: Samples of a quality improvement plan

Sample A

Problem	Activity	By whom	When	Results
Long waiting times at clinic	Conduct client flow analysis	Clinic supervisor and team	10 Nov 2011	Analysis of waiting times
	Process mapping	QI team	15 Nov 2011	Analysis of bottle necks – action plan
	Training of queue marshals, admin clerks, pharmacy assistants	Clinic manager	20 Nov 2011	Triage strategies
	Change to appointment system, use of afternoons	QI team; Clinic Supervisor; District Manager	30 Nov 2011	Reduction in waiting time by 25% in two weeks

Sample B

Problem	Activity	By whom	When	Results
Lack of functional hospital board	Review of terms of reference; composition and standing orders.	CEO	10 April 2012	Clear understanding of roles , responsibilities and terms of reference; checklist of requirements
	Review of reasons why board was not functioning; review of minutes; frequency; and causes for not functioning	CEO and senior management team	20 April 2012	Report on why the board was not functioning, and recommendations for its future successful functioning.
	Dissolve existing hospital board, as per standing orders	CEO	1 June 2012	Existing board dissolved.
	Advertise for nominations for newly formed hospital boards; appoint as per standing orders	CEO	15 June 2012	New board members appointed with signed letters.
	Orientation of board members	CEO and senior management		Clarification on roles and responsibilities.
	Inaugural meeting of new board	CEO and new board	1 August 2012	Functioning board.

APPENDIX C: National Core Standards: Examples of inputs, process and outcomes

The methodology used in the development of the National Core Standards (standards, criteria and measures) was a structured approach in which the elements were classified into those concerned with:

- Systems or inputs
- Process
- Outcome or output

- 1. *Systems/Input*** elements are those that pertain to the legislative environment in which the standards rest and the resources required to comply with those obligations whether those are staffing, infrastructure or committees. Examples of systems elements include:
 - Legal compliance/statutory obligations (national acts and regulations/Auditor general/ Pharmacy council compliances)
 - Policy and procedure follows acceptable practice/national guidelines
 - Structures which include the management, governance and quality committees who support and oversee the quality functions
 - Organisational culture to support practice
 - Resources in terms of staff, infrastructure and equipment, financial and materials – including logistics
- 2. *Process*** elements refer to the instructions given and actions taken by staff in order to implement quality procedures in the establishment and they can take the form of:
 - Procedures which detail how to do things such as clinical protocols for conditions, management procedures ,operational processes, reporting systems and procedures
 - Control mechanisms which detail how systems and procedure compliance is measured and includes surveillance mechanisms (reactive or proactive) and risk identification mechanisms
 - Staff development and training processes including performance management processes
 - Patient awareness processes both of patients' education and communication to the public
 - Quality improvement process in which a structured process of plan, do, review, report and evaluate is followed
- 3. *Outcome*** elements look at measuring the response to the above interventions. Outcomes can be clinical such as the infection rates related to clinical procedures or they can be output of management processes such as staff and patient satisfaction levels.

APPENDIX D: An example of the application of Lean Methodology – Newcastle Hospital OPD Pharmacy Improvement Project

Like many other pharmacies at public hospitals, patients at the Newcastle Hospital, KZN complained bitterly about long waiting times to get their medication. In fact some left without their medication and didn't bother to come back to collect it.

In November 2010, as part of a DOH initiative, the hospital undertook a QI project to improve the situation. They used the A3 method and when they measured the waiting times they found that the average waiting time was 1 hour 28 minutes, but it could be as long as 3 hours 5 minutes.

When the team investigated causes they found a lot of wastage in the process such as:

- Patients queue twice if the prescription is wrong
- Unnecessary movement of staff inside the pharmacy to fetch medication
- Poor planning of staff availability over lunchtime when many patients were waiting
- Long process because file gets dropped in box, then pharmacist picks medicine before labels are attached at a central table, another pharmacist checks it and then it is dispensed at a window at the far end of the picture.



The QI team decided that the quickest improvement would be to have three separate drop boxes for patients who fetch their medicines in the afternoon or the next morning. That way the pharmacists could prioritise medicines for patients who were waiting. This immediately reduced the average waiting time to 1 hour (a 32% improvement) and longest waiting time to 1 hour 52 minutes (a 39% improvement).



After the project Newcastle Hospital continued to measure waiting times using an innovative and time-saving method. When the last file was dropped in the box, the time would be written on a sticker. When the patient collected their medicine the time was again recorded and the sticker was transferred to a book so that the average for the day could be worked out. The graph below (Figure 16) shows that up until March 2011 average waiting time was reduced to about 40 minutes, but then it started increasing again.

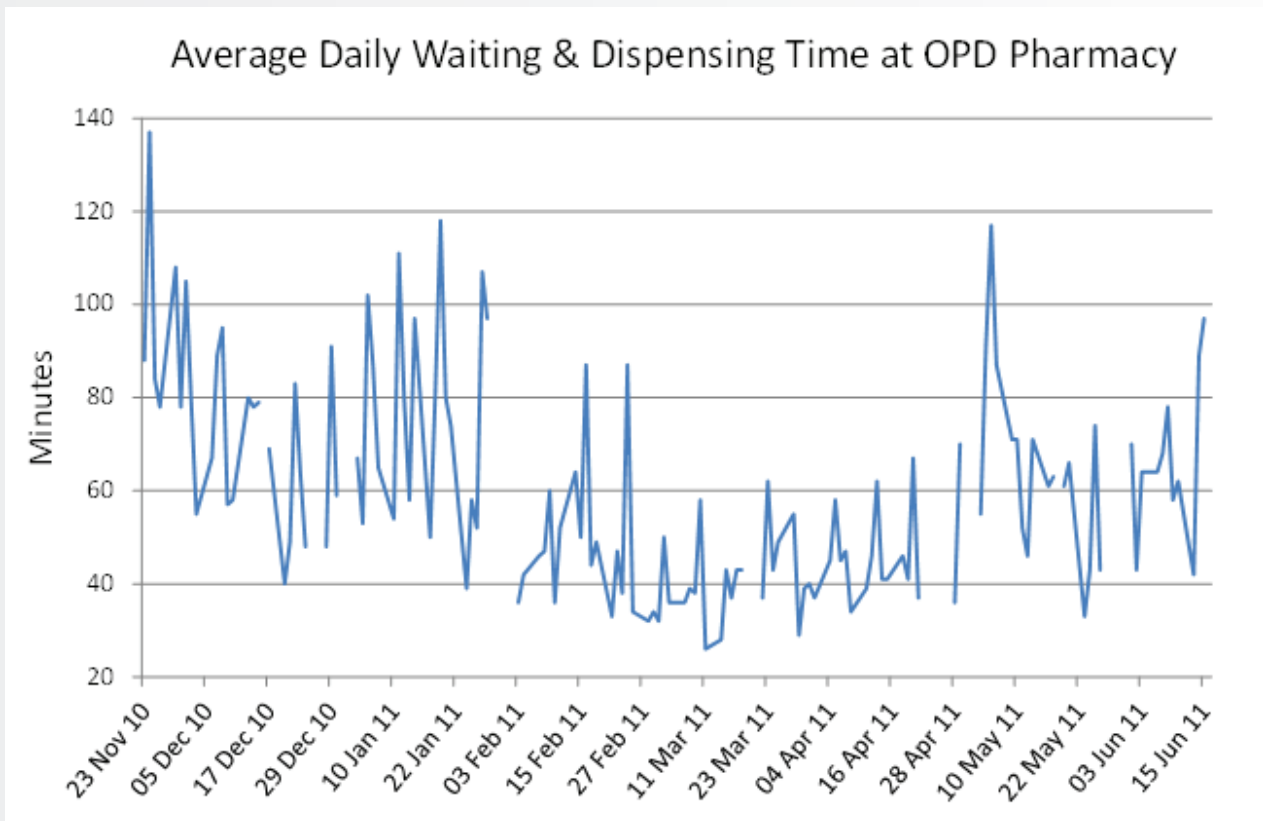


Figure 16 – Average waiting times in the pharmacy

In June 2011, the hospital decided to address the deteriorating situation. This time the improvement project used the A3 method. To eliminate the waste of movement inside the pharmacy their main recommendation was to open two more dispensing windows and serve patients directly instead of them dropping their files into the boxes.

The end results were that most days all patients were served by 14:00, the number of patients not collecting medication was reduced – meaning that the medication did not need to be unpacked again – and, most importantly, the average waiting time went down to just 20 minutes.

This is a magnificent achievement. It shows what can be done if performance measurements are maintained so that staff can see how well they are doing and carry out a process improvement project when performance is unsatisfactory.

For more information you are welcome to contact anton.grutter@gsb.uct.ac.za at the Lean Institute Africa.

¹ Internal Concept papers and working documents. National quality programme (OSC DOH) July 2009- April 2010.

