

NCD Quality Improvement Module—for Health Facility Staff

FIRST DRAFT

8 December 2016

Acknowledgements:

Produced by Walimu, a Ugandan NGO also registered in the USA. Drafted by Shevin Jacob and Elijah Goldberg, in collaboration with and on a contract from WHO Department for Management of Noncommunicable Diseases, Disability, Violence and Injury Prevention, Management of Noncommunicable Diseases.

Quality improvement module:

Improving the quality of your health facility's care and management of patients with non-communicable diseases

Learning objectives

1. Define high quality of care and understand some of the major theories and tools to improve quality of care at your facility.
2. Understand the determinants of quality of care in relation to the care and management of patients with non-communicable diseases
3. Understand how to apply principles of quality improvement to implement your health facility quality improvement plan

Quality is at the centre of the health facility clinical team's role. Investing in quality improvement is one of the few steps that your team can take that yields better outcomes for patients, a better work environment for staff, and reduced costs for the patients. Good managers improve quality to get the best out of their staff and do the most for their patients.

Although quality improvement is often targeted at specific types of care, such as HIV, maternal, newborn or child care, the basic concepts and systems are applicable across all care delivered by the hospital. In this chapter, we will guide you to set up an effective quality improvement system at your health facility, with a particular focus on management of non-communicable diseases (NCDs). However, we encourage you to build quality improvement systems that are crosscutting throughout your facility. Quality improvement, when done correctly, can lead to substantial gains for the hospital and its patients.

We will begin by defining high-quality care and discussing the importance of quality in the context of NCDs care delivery. We will then discuss three crucial stages of the quality improvement process:

1. Identifying barriers to high-quality care;
2. Implementing a continuous improvement system;
3. Using data to benchmark progress

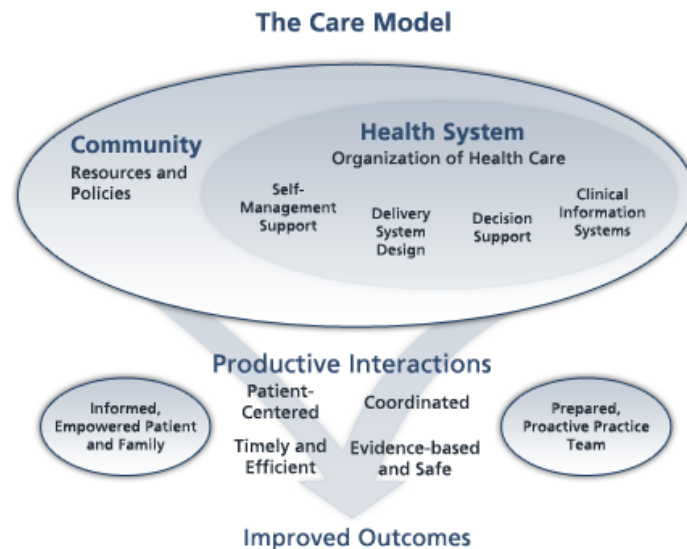
For each stage, we will provide an exercise for you to complete, to demonstrate the practical aspects of managing quality improvement at your facility.

There are many different methodologies and approaches to quality improvement, and we encourage you to explore these. We have described some common methods, including the basic principles of the Plan-Do-Study-Act cycle (PDSA) at the end of this chapter.

More important than any specific methodology, quality improvement efforts succeed or fail based on the people involved. Any institution – if it has committed change leaders – can improve the quality of the work it does. As a manager, it is your responsibility to both lead change and empower those on your staff to do so as well. The benefits could be significant – less redundant work, fewer wasted resources, and – most importantly – better patient outcomes.

Defining high-quality care and its importance in care of the patient with NCDs

High-quality care of patients with non-communicable diseases requires a number of factors to come together (See Chronic Care Model figure below). For example, systems need to be in place which enable identification of patients with a non-communicable disease like hypertension or diabetes (i.e., screening). Patients need to then be triaged based on their illness severity, whereby severely ill patients (e.g., diabetic ketoacidosis) will need acute management and hospitalisation, perhaps including referral to a higher health facility level. On the other hand, patients with milder disease can be discharged home and will need to be provided education about their condition, a prescription for appropriate medication, and clear plans for follow-up. Since most non-communicable diseases manifest as chronic disease, systems are also necessary to ensure, that once identified, patients with non-communicable diseases are followed up and their visits documented regularly over time to help prevent acute complications which might arise from ineffective disease control. Without quality measures in place, it is very easy to miss cases who present to health facilities, provide treatment incorrectly, and lose patients to follow-up. These gaps in the overall system can lead to avoidable consequences, ranging from increased burden of severe non-communicable disease manifestations and related costs to permanent disability and death.



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Identifying barriers to high-quality care

What makes quality improvement particularly challenging is that quality of care is influenced by almost every part of the health care delivery process. If any part – financial resources, staffing, care processes, etc. – break down, it can negatively impact quality in a substantial way.

In fact, there are many determinants of quality, including:

- **Technical competence** of your staff
- **Access to services** by your patients
- **Efficiency** of care delivery
- **Effectiveness** of care delivery
- **Teamwork** in the facility
- **Leadership** of the facility

As a result, it can be challenging to know where to start. If quality depends on everything, you might conclude that you need to fix everything in order to improve quality. However, there is a simple, powerful process for prioritizing improvement: **barrier identification**. Barrier identification involves a straightforward process-- identify the problem in a particular aspect of care→trace out the processes and structures that contribute to that care→analyse the processes and structures for deficiencies→prioritize deficiencies on which the problem depends.

This process is the same we take to solve almost any problem: identify that a problem exists→trace all the factors that are related to the problem→analyse to determine what factor(s) are not working→prioritize the factor(s) that you actually need to fix to resolve the problem.

¹ Source: Wagner EH. Chronic disease management: What will it take to improve care for chronic illness? *Effective Clinical Practice*. 1998;1(1):2-4

Consider the following example: A 23 year-old man is brought to the outpatient department of your health facility by his mother and brother. On immediate evaluation, you note that he has an emergency sign of altered consciousness. He is identified in the registry as a patient who has received ongoing care for diabetes mellitus, type 1. His mother mentioned that he has had nausea, vomiting and abdominal pain for the past day and he ran out of insulin 3 days ago. From the registry, you note that he has missed his past 2 scheduled follow-up visits in the weekly diabetes clinic held at your OPD on Thursday mornings. You are concerned that his altered consciousness may be related to his diabetes but you recall that the glucometer has been out of test strips for the past 3 weeks. On exam, you note that the patient is breathing fast and that his breath has a sweet odour to it. You immediately initiate intravenous saline because of your concern that the patient may be in diabetic ketoacidosis (DKA). As you continue managing the patient, you have concern about the inability to measure his blood glucose or monitor his electrolytes (especially potassium). You consider referring him to the district hospital so that he can get the level of monitoring necessary for the management of DKA.

Reflecting on this case, what problems exist in the delivery of care for this patient? What are the various factors related to the problem? Which factors are not working at your health facility? Which factors should you prioritize to fix the problem now and in the future?

On the next page, you will complete a group exercise to identify barriers to care at your health facility for two processes.

Group Exercise 1: Barrier identification

In the chart below, identify two care processes that are not functioning optimally in your health facility. Describe the care process, where it occurs, and what the problem is in the process. Next, describe all the processes and resources that the care process requires to function. Finally, identify which processes or resources are deficient, and rate whether those deficiencies are a) causing, b) contributing, or c) not important to the problem (multiple processes or resources can be causing the problem).

Here is an example using the case above:

Care process	Managing diabetic ketoacidosis	
Location in the hospital	Outpatient department	
Problem in the process	Inability to monitor glucose and electrolytes for a patient with diabetic ketoacidosis	
Describe the <u>processes</u> and <u>resources</u> the care process requires to function:		
<ol style="list-style-type: none"> 1. Identification of patients with emergency signs 2. Identification of patients who need glucose monitoring 3. Maintaining an up-to-date registry with active case follow-up of patients with chronic illness 4. Ensure that necessary supplies (including tests for monitoring glucose and electrolytes as well as necessary treatments) for delivering effective care to patients with diabetes are stocked for at least 3 months 5. Proper inventory management in the store to identify when supplies are out 6. Establishing processes for referring to higher level of care when necessary 7. Financial resources to pay for monitoring equipment 		
Describe the <u>processes</u> and <u>resources</u> that are deficient, and rate whether those deficiencies are <u>causing</u>, <u>contributing</u>, or <u>unimportant</u> to the specific problem.		
3. The patient was lost to follow-up even though he is in the OPD registry	<input type="checkbox"/> Causing	<input checked="" type="checkbox"/> Contributing
	<input type="checkbox"/> Not important	
4, 5. Glucose monitoring equipment has been out of test strips for 3 weeks	<input checked="" type="checkbox"/> Causing	<input type="checkbox"/> Contributing
	<input type="checkbox"/> Not important	
6. Uncertain plan for referring to a higher level of care	<input type="checkbox"/> Causing	<input type="checkbox"/> Contributing
	<input type="checkbox"/> Not important	<input checked="" type="checkbox"/> Not important

Now complete the chart for processes related to NCD care delivery that are not functioning at high-quality. If possible, try to provide real examples from your health facility: one for care delivery of patients with **hypertension** and one for care delivery of patients with **high cardiac risk**

Example #1: Care process	
Location in the hospital	
Problem in the process	
Describe the <u>processes</u> and <u>resources</u> the care process requires to function:	
Describe the <u>processes</u> and <u>resources</u> that are deficient, and rate whether those deficiencies are <u>causing</u>, <u>contributing</u>, or <u>unimportant</u> to the problem.	
	<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important
	<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important
	<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important

		<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important
		<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important
Example #2: Care process		
Location in the hospital		
Problem in the process		
Describe the <u>processes</u> and <u>resources</u> the care process requires to function:		
Describe the <u>processes</u> and <u>resources</u> that are deficient, and rate whether those deficiencies are <u>causing</u>, <u>contributing</u>, or <u>unimportant</u> to the problem.		
		<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important
		<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important

	<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important
	<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important
	<input type="checkbox"/> Causing <input type="checkbox"/> Contributing <input type="checkbox"/> Not important

Implementing a continuous quality improvement system

Identifying barriers to care should be done through a system for continuous improvement. The key to continuous improvement is building a system that is durable enough to continue functioning – through turnovers in staff, changes in the resource environment, or other external factors.

One of the most common tools for implementing continuous quality improvement is the **plan-do-study-act** cycle. The cycle is designed to be a continuous loop of the following activities:

- **Plan:** Identify your objective and plan how you will carry out this cycle.
- **Do:** Carry out the plan and collect data.
- **Study:** Analyse the data to determine if the plan worked and the objective was achieved.
- **Act:** Determine what changes need to be made and start the next cycle.

Appendix A provides more information about how to run the plan-do-study-act cycle. In this chapter, we will focus on building the system necessary to support the cycle. Quality improvement is particularly different because in many settings it is simultaneously everyone's job and no one's job. In other words, every person contributes to improving (or not improving) quality, but no one person has it as his or her primary responsibility. This can lead to a high degree of inertia, particularly in facilities where resources are already constrained. As a result, quality improvement tends to be de-prioritized in favour of the basic tasks of running the hospital.

For the facility manager or mentor: it is more important that you enable the quality improvement system than that you actually improve quality yourself. You are the critical stakeholder that can empower an effective quality improvement system at your facility.

The following steps will help enable the quality improvement system:

1. Recruit a champion

A champion who can spearhead quality improvement at your facility is an essential first step. Studies have shown that facilities with quality champions tend to perform better.²

The quality improvement champion should be hard-working, reliable, well-respected among the staff, and enthusiastic about improving quality.

2. Give the champion real power

In order to be successful, the quality champion needs real power within the hospital. Consider giving them a public mandate with the staff, as well as regular access to you and other senior managers. Back up their work where you can.

3. Promote staff buy-in from the beginning

Staff engagement is critical to the success of the quality improvement system. Quality improvement often means more work or changes in work, particularly at the beginning of system implementation. In the long-run, quality improvement can reduce staff workload and improve the working environment, but often that means increased work in the short-term.

Early in the process, convene a meeting with the staff to explain the quality improvement system and why it is crucial. Provide a regular forum for staff to provide feedback, and actually incorporate that feedback into quality improvement activities. If staff have a voice in how the system is run, they are much more likely to support it.

4. Build the right team around the champion

The champion cannot act alone, but also be cautious of the dangers of a committee. Too many voices can lead to confusion and delay and too much distributed responsibility can lead to apathy and little accomplished.

A good strategy for building a quality improvement team is to ensure that each member has a specific, well-defined function within the team. Some members could have responsibility over a particular physical area of the facility, some could be in charge of problem identification and feedback from staff, others in charge of implementing changes, and others in charge of tracking data.

5. Set up routine improvement cycles following a standard format

Continuous improvement requires you to define cycles over which improvements will be planned, made and benchmarked. Bi-weekly or monthly

² <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3401398/>

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3535479/>

are common lengths for cycles – that gives enough time for improvements to be made, but not too much time for momentum to be lost.

Each cycle should follow a standard format:

- Who are the team and the lead?
 - What is the goal to be achieved?
 - When will the results be re-assessed?
 - Where will it be implemented as a pilot project?
 - How will the goal be achieved?
 - Resources?
- 
- Implement.
 - Keep a log of barriers and facilitators.
 - Re-measure.
 - Reflect on the knowledge gained in this cycle – why did it work or why did it fail? Unexpected results?
- Goal achieved?
 - Implement across the system.
 - Goal not achieved?
 - Re-plan

6. **Set ambitious objectives and track progress publicly**

The quality improvement team will set goals for each cycle, and develop systems for benchmarking progress toward those goals. However, as a manager, you play an important role in setting overall objectives and tracking progress publicly among the staff.

7. **Use tools and techniques to drive change**

Later in this chapter we discuss some common tools that both quality improvement teams and managers can use in changing behaviour and improving quality on the ward. Use these tools to accelerate and sustain progress.

8. **Develop guidelines for the quality improvement team**

The quality improvement team should have some basic guidelines for how it will operate, what methods it will follow, and what scope it is working on.

However, just because guidelines may call for a meeting every week or a particular set of data to be collected does not mean it will happen. Do not just rely on guidelines to keep the system going.

9. **Support the quality improvement system in the early stages**

Every quality improvement system will take time to become fully embedded into the standard processes of the hospital. It is crucial that you as the manager are actively involved and supportive of the quality improvement system over the first year. If you can maintain the system and activities long enough, eventually the quality improvement system will continue to function on its own. This assumption, however, requires an early investment of time and attention on your part to get there.

There are several tools and techniques that you and the quality improvement team can leverage to improve quality. When considering which tool to use, it is important to consider how it may influence the behaviour of health workers. The behaviour change wheel describes three essential conditions for behaviour change: capability, opportunity, and motivation.³ Capability is defined as an individual's physical and mental capacity to engage in the behaviour. Opportunity is defined as the factors outside of the individual that make behaviour possible, such as access to resources or a cultural norm that encourages the behaviour. Motivation is defined as all the brain processes that energize and direct behaviour.

Keep in mind: all of these techniques should be employed within the context of a continuous improvement cycle. These cycles – often run by collaborative improvement teams or quality improvement teams – include application of the tools below to drive measurable improvement in key objectives.

- **Clinical mentoring**
Clinical mentoring is conducted by an expert clinician who provides refresher information on clinical practices, runs teams through clinical drills, and provides supervision and feedback on care observed.
- **Continuing medical education (CME)**
CMEs typically occur on a regular basis (weekly or monthly) and involve short sessions during which one clinical topic is reviewed.
- **Supportive supervision**
Supervision is the process whereby external or internal senior or mid-level staff provide support while supervising health workers.⁴
- **Guideline development:** Adapt national or other evidence-based guidelines to your health facility's requirements, taking into account available resources. Guidelines by themselves do not change behaviour. When accompanied by practical tools such as order sets, checklists, and protocols, they are very helpful in QI.
- **Treatment protocols and standardized order sets:** Use of these tools help improve quality by facilitating appropriate interventions.
- **Checklists:** Checklists serve as reminders for practitioners to carry out all appropriate steps during an examination or other procedure. This toolkit

³ <https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-6-42>

⁴ http://www.who.int/immunization/documents/MLM_module4.pdf

provides several sample checklists that can be modified for other aspects of care.

- **Audit and feedback:** Audit and feedback refers to periodic checks of individual performance (e.g. hand-washing) with early feedback to the individual or team so that areas for improvement are quickly identified.
- **Quality rounds:** Quality rounds refer to case reviews used to identify areas for improvement in the system.
- **Organization of work:** Organization of work can include providing additional resources and equipment, introducing organizational changes, and redesigning processes.
- **Performance-based incentives:** Monetary and non-monetary incentives that are based on achieving targets for performance can motivate health workers to improve. Sometimes, non-monetary incentives can be particularly powerful: for instance, rewarding top performers with public recognition. Be cautious in implementing performance incentives, however, as they can distort behaviour in unintended ways. Always give careful thought to what incentives you are creating for your staff.
- **Reminders:** Sometimes, all a staff member needs is a reminder of what he or she needs to do. Manual and automatic reminders can push staff to carry out the correct behaviour at the correct time.

With the correct mix of tools, applied through the continuous improvement cycle, any team can drive rapid improvement in its objectives.

On the next page, you will complete a group exercise to plan implementation of a quality improvement system at your facility. This is modelled after the list of steps to set up a quality improvement system described earlier in the chapter.

Group Exercise 2: Plan implementation of a quality improvement system

Use this worksheet to brainstorm for the first six steps in setting up a quality improvement system.

1. Recruit a champion		
The champion should be hard-working, reliable, well-respected among the staff, and enthusiastic about improving quality.		
Options for champions at your facility		
Name	Pros	Cons
Top candidate:		

2. Give the champion real power
In order to be successful, the quality champion needs real power within the health facility.
Identify what tangible ways you will the champion power to implement change:

3. Promote staff buy-in from the beginning
Staff engagement is critical to the success of the quality improvement system.
Identify some strategies for getting staff buy-in:

4. Build the right team around the champion

A good strategy for building a quality improvement team is to ensure that each member has a specific, well-defined function within the team.

Identify roles and possible candidates for your team

Role	Candidates

5. Set up routine improvement cycles following a standard format

Continuous improvement requires you to define cycles over which improvements will be planned, made, and benchmarked.

How long will each cycle be?	
When will you meet to plan the cycle?	
Who will attend the meetings	

What will be the format for the meetings?	
--	--

6. Set ambitious objectives and track progress publicly As a manager, you play an important role in setting overall objectives and tracking progress publicly among the staff.	
What are the top three things you want the quality improvement system to accomplish?	
Objective	How to track and report progress

Using data to benchmark progress

For any quality improvement system, being able to understand and track progress is critical for success. To do so, your team needs both quality data and quality indicators.

Indicators fall into three categories: structural indicators, process indicators, and outcome indicators. Structural indicators capture the physical reality of the hospital – numbers of beds, presence of medicine, etc. Process indicators capture the patient interventions – lab testing, medical procedures, medicines provided, etc. Outcome indicators capture what we ultimately care about: patient morbidity and mortality.

Structural indicators include:

- The proportion of health facilities that have the equipment and supplies to provide full hypertension/ diabetes/HCR services on the day of the survey
- % X core CVD medicines, technologies, and diagnostics with no stock out in past 3 months
- Defined roles and responsibilities of staff, including doctors, other district clinicians, nurses, pharmacists, dieticians and other ancillary staff.

Process indicators refer to any patient interventions such as medical procedures or medications provided. They relate directly to how clinicians provide care for the patient.

Process data can generally be collected from patient records, for example through chart audits or from real-time recording at the patient's bedside. Many process measures are targets for quality improvement (QI) initiatives.

The ideal process indicator is **SMART**:

- **Sensitive + specific** for the quality target
- **Measurable** (the process measure has to be measurable in practice)
- **Actionable** (if the process measure shows poor performance, there are specific actions to take)
- **Reliable** (>1 observer agrees on the measure)
- **Timely** (measure available in real-time).

See Annex B for a list of suggested process indicators for management of patients with non-communicable diseases (from chapter 11, table 11c in the DRAFT District NCD case management implementation planning manual- for district managers in low-resource settings)

The cohort register in NCD patient monitoring system for cardiovascular risk/HTN/DM measures is used to generate important case management outcome variables. These are found in Annex C.

Other outcome measures include severe morbidity requiring hospitalization, mortality, length of stay (if hospitalised), and cost of care. Outcome measures are influenced by many other factors – in particular, patient factors – besides the processes of care we try to achieve. Thus, to compare mortality, known as benchmarking, one needs to statistically adjust for patients' diagnoses and severity of illness at the time of clinical presentation.

Group Exercise 3: Developing quality indicators for care of patients with non-communicable diseases

Using the chart below, develop a set of quality indicators for tracking the quality of care of either hypertension, diabetes, or high cardiac risk. Describe the type of indicator, the indicator variable, and the source of the data. You can either choose indicators from the lists in Annex B and C from the patient monitoring system or you can decide on other indicators related to the care processes in your health facility.

You can group indicators if helpful. Only use the boxes you need – the objective is to identify the fewest possible indicators to capture quality.

Type	Indicator	Source
Type	Indicator	Source
Type	Indicator	Source

Type	Indicator	Source

Annex A: Principles of Quality Improvement (QI)

In the traditional approach of quality improvement, problems with quality are seen as occurring as a result of deficits in knowledge or skill in a few individuals. The solution is often to impose disciplinary action and remedial training. This approach pays little attention to system design or expected human error.

Issues with quality actually occur due to multiple reasons, not just deficiency in a few individuals. These reasons include:

- latent structural issues related to the organisation of care;
- poor work conditions with overworked staff, lack of supervision, poor communication, and a lack of equipment, knowledge, and skills;
- point of care issues that include cognitive and non-cognitive errors.

There are several practical principles that guide QI:

1. Select quality targets.
2. Create a simple, practical, and focused data collection system (see implementation manual for information about registry). It does not have to be complicated, and you do not have to collect data on all targets all the time. It is also important NOT to collect data on processes you already deliver well or outcomes you cannot directly improve. Create a culture of quality and safety that becomes every staff member's responsibility. Remember that the aim is to improve care, not to punish workers.
3. Create an interdisciplinary team that can prioritize projects and engage smaller teams to focus on implementation and measurement for each project selected.

The Plan-Do-Check/Study-Act Cycle

The Plan-Do-Check/Study-Act cycle is a simple yet powerful method to help discover how to effectively and efficiently design or change a process. Spending time in each phase of the cycle will create a smooth quality improvement process.

PLAN. This part of the cycle requires an understanding of current standards of care for patients. If no standards exist, they should be developed and disseminated by all stakeholders. Then the group can identify and prioritize areas of improvement. This is also a good point to plan for data collection.

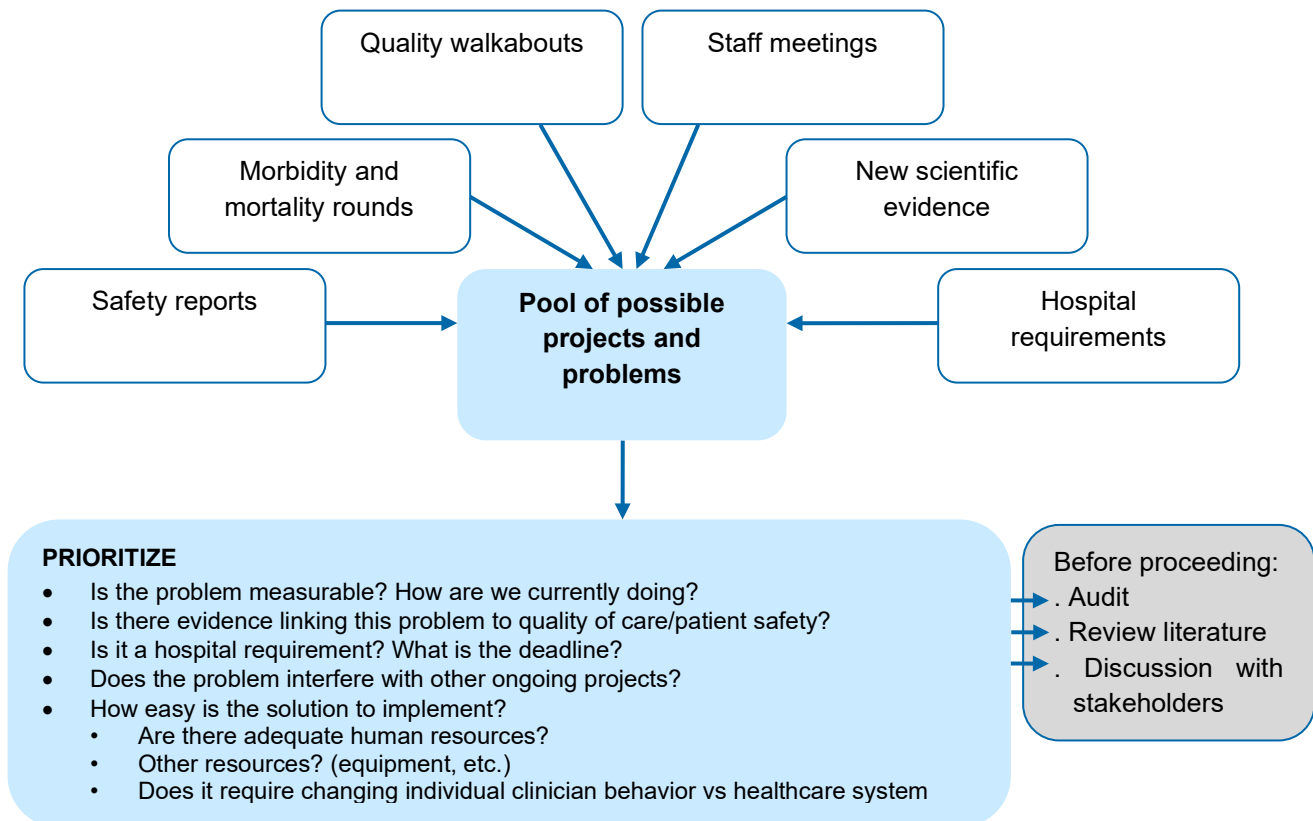
DO. This part of the cycle requires implementation of changes, such as using this training programme. This is also when you document problems and unexpected observations, and begin analysis of your data.

CHECK/STUDY. This part of the cycle requires monitoring performance, including qualitative monitoring done by direct supervision and self-assessments.

ACT. This part of the cycle requires evaluating performance and then using the information to modify plans for change and disseminating information.

Step 1 in QI: Identify, Understand, Prioritize, and Plan

This flowchart provides a possible framework for selecting a problem and the essential steps in the Plan-Do-Study-Act cycle (used with permission from Dr Andre Amaral, Sunnybrook Health Sciences Centre and University of Toronto, Toronto, Canada).



Once a QI problem is identified, consider the following issues to help anticipate barriers to implementation of QI and to understand how QI will move forward:

- Organisational issues, including infrastructure, staffing and culture
- Equipment issues and human error related to the way clinicians use the equipment
- Professional issues that include knowledge and skills, attitudes, peer opinions, memory, time factors

It is important to prioritize targets based on the importance to patients and their families, the feasibility of measuring and making changes, and the relationship to other on-going projects. It is important to build on what you are already doing and to collect data on outcomes that you can directly improve.

Step 2 in QI: Match the Solution to the Problem

Before implementation of any intervention, it is important to refine it and pilot test. Keeping the intervention simple, practical, and focused maximizes the chance of success.

Here is a list of tools or interventions that are commonly used to improve quality:

- **Guideline development:** Adapt national or other evidence-based guidelines to your hospital's requirements, taking into account available resources. Guidelines by themselves do not change behaviour. When accompanied by practical tools such as order sets, checklists, and protocols, they are very helpful in QI.
- **Treatment protocols and standardized order sets:** Use of these tools help improve quality by facilitating appropriate interventions.
- **Checklists:** Checklists serve as reminders for practitioners to carry out all appropriate steps during an examination or other procedure. This toolkit provides several sample checklists that can be modified for other aspects of care.
- **Audit and feedback:** Audit and feedback refers to periodic checks of individual performance (e.g. hand-washing) with early feedback to the individual or team so that areas for improvement are quickly identified.
- **Quality rounds:** Quality rounds refer to case reviews used to identify areas for improvement in the system.
- **Adequate supervision:** Supervision allows for the provision of real-time feedback to staff.
- **Education:** Training and re-retraining of staff provides an organized opportunity to increase technical competence.

Steps 3 and 4 in QI: Check/Study and Act

Once the intervention is implemented, the impact of change can be evaluated by re-measuring the quality indicator. This information can then be used to modify the intervention as needed. If the intervention does not have the desired effect, it provides opportunities for further learning and improvement. Share the results with colleagues, staff, hospital administrators, patients, and families.

Realistic expectations of QI

Do not set yourself up for disappointment by expecting "magic bullets" from QI. These interventions generally produce modest gains, like most drugs and procedures in clinical medicine. If these interventions are widely adopted, the gains are important.

You do not need an expensive and sophisticated computer system for data collection to make the QI process work. If your health facility has poor data collection processes, see the WHO's publication *A methodological guide for data-poor hospitals*, available at http://www.who.int/patientsafety/research/methodological_guide/en/index.html.

Checklist 1: Initiating or Improving a Quality Improvement Programme

- Do background work: Identify motivation, support teams and develop strong leadership.
- Prioritize potential projects and choose the projects to begin QI.
- Prepare for the project by operationalizing measures, building support for the project, and developing a business plan.
- Carry out an environmental scan to understand the current situation (structure, process, or outcome), the potential barriers, opportunities, and resources for the project.
- Create a data collection system to provide accurate baseline data and document improvement.
- Create a data reporting system that will allow clinicians and other stakeholders to see and understand the problem and the improvement.
- Introduce strategies to change clinician behaviour and create the change that will produce improvement.

Checklist 2: Evaluating and Sustaining a Quality Improvement Programme

- Determine whether the target is changing with on-going observation, periodic data collection, and interpretation.
- Modify behaviour change strategies to improve, regain, or sustain improvements.
- Focus on sustaining interdisciplinary leadership and collaboration for the quality improvement programme.
- Develop and sustain support from hospital leadership.

Using the Plan-Do-Check/Study-Act cycle in your hospital for making changes

Category	Describe Process of Plan-Do-Check/Study-Act Cycle in your hospital
PLAN	
DO	
CHECK/STUDY	
ACT	

Annex B: NCD Case Management Process Indicators. From Chapter 11, patient and programme monitoring in the draft Integrating NCD case management interventions into district health services- an implementation manual for district managers in low-resource settings

Indicator type	Indicator	Data source/ collection
Inputs		
Trained staff	% staff trained on HEARTS in past one year (by cadre)	Health facility survey
	The proportion of health facilities with at least xx % of health workers trained to screen for hypertension and diabetes and assess cardiovascular risk	
	The proportion of first-level health facilities with at least vv% of health workers trained to provide chronic care for HTN/DM/PCVD	
Clinical aides	Evidence-based CVD algorithms available	
	CVD counselling guides available	
	Patient CVD health education / self care handouts available	
Equipment and supplies	The proportion of health facilities that have the equipment and supplies to provide full hypertension/ diabetes/HCR services on the day of the survey	
Core medicines	% X core CVD medicines with no stock out in past 3 months	
	(Days out of stock per core medicine)	
Core technologies	% X Core CVD technologies available and functional	
	% X Core CVD diagnostic supplies with no stock out in past 3 months	
	(Days out of stock per core diagnostic supply)	
	(Staff demonstrate correct use of core technologies)	
QI system	Internal performance review reports available per defined period	Health facility survey or supervision reports
	Supervision visits received per defined period	
Monitoring tools	Adequate supply of CVD risk screening forms available	Health facility survey or annual review
	Adequate supply of new individual CVD patient records available	

	CVD patient register available	
Processes	QoC/adherence to algorithms	
History/ Examination	% CVD patients with tobacco use documented at last scheduled visit	Patient card, annual review of patient monitoring system
	% CVD patients with alcohol use documented at last scheduled visit	
	% CVD patients with physical activity level documented last scheduled visit	
	% CVD patients with BMI recorded in past 1 year	
	% CVD patients with blood pressure recorded at last scheduled visit	
	% CVD patients with total cholesterol recorded	
	% CVD patients with urine protein test recorded in past 1 year	
	% CVD DM patients with HbA1c according to protocol frequency, or FBG/RBG at last scheduled visit	
	% registered DM patients with foot examination documented at last scheduled visit	
% CVD DM patients with fundus examination in last 2 years		
History/ examination/risk assessment	The proportion of patients >40 or with risk factors attending a primary care facility who are checked for hypertension and diabetes and have cardiovascular risk correctly calculated	
Risk assessment	% CVD patients with CVD risk recorded in past 1 year / at last scheduled visit?	
	% CVD patients with last CVD risk correctly calculated	
Treatment	% CVD patients with high blood pressure recorded without appropriate action	Patient card
	% registered patients with high blood glucose recorded without appropriate action	Patient card
Referral	% patients referred that have back referral note	
	% CVD patients with failure to refer according to criteria	
Counseling	% CVD patients who smoke that received brief intervention on tobacco	Patient card

	% CVD patients that received lifestyle & self care counselling	Patient card
Processes	Monitoring system	
Patient record	Completeness of required fields (composite score)	Annual review of patient monitoring system
Register	CVD patient register up to date (Entries available for last service day)	
	CVD patient register complete (all register fields filled)	
	CVD patient register correct (register entries match individual records entries)	
Routine reports	Monthly HIS reports complete, correct and submitted on time	
Outputs		
Referrals	No. of CVD referrals up	Patient card/annual review
Risk assessment/ screening	% eligible catchment population screened at least once per year at health facility	Register, annual review
	% patients screened who have CVD risk (by risk level)	Register, annual review
Patient support	No. of support group sessions held	Health facility survey
	No. of CVD patients attending support group sessions	
Community awareness	No. of facility health education sessions held	
	No. of community health education / engagement activities (define according to context)	
Coverage	% of expected high risk (>30%) "ever" registered/ active	Numerator: register/Cross-sectional report.
	% of expected hypertension ever registered/active	
	% of expected diabetes ever registered/active	Denominator: estimated cases in district

Annex C: NCD Case Management Outcome Indicators

From Chapter 11, patient and programme monitoring in the draft Integrating NCD case management interventions into district health services- an implementation manual for district managers in low-resource settings

Baseline and annually thereafter:

- Proportion in care by outcome status (Alive and on treatment, dead, MISS, lost to follow-up -- hasn't been seen 6 months after last missed appointment, transfer out)
- Proportion in care by diagnosis (DM1, DM2, HTN, DM+HTN, high cardiovascular risk based on Prior CVD (PCVD), PCVD+HTN, PCVD+DM, PCVD+HTN+DM)
- Total in care

Of those alive and on treatment

<i>High cardiovascular risk</i>	<p>Number with CVD risk % measured</p> <ul style="list-style-type: none"> • Proportion those with CVD risk % ≥ 30 reduced to 20 to $< 30\%$ (in last year) • Proportion those with CVD risk % 20 to 30% reduced to $< 20\%$ (in last year) • Total proportion those with CVD risk % reduced in last year <p>Number with CVD risk assessed (CVD risk % or PCVD)</p> <ul style="list-style-type: none"> • Number, proportion CVD risk % ≥ 30 (no PCVD) <ul style="list-style-type: none"> ○ Proportion on: statin, low-dose aspirin • Number, proportion PCVD <ul style="list-style-type: none"> ○ Proportion on: statin, low-dose aspirin, anti-hypertensive • Total number, proportion CVD risk % ≥ 30 or PCVD <ul style="list-style-type: none"> ○ Proportion on: statin, low-dose aspirin, anti-hypertensive
<i>Diabetes case management outcomes</i>	<p>Number, proportion with diabetes diagnosis with fasting blood glucose (FBG) (or HbA1c if available) measured</p> <ul style="list-style-type: none"> • Mean FBG (or mean HbA1c if available) • Proportion with < 7 mmol/L FBG (or $< 7\%$ if HbA1c) • Proportion on: metformin, insulin, non-pharmacological management only (NPMO)
<i>Hypertension with diabetes or high cardiovascular risk case management outcomes</i>	<p>Number with hypertension and diabetes or high cardiovascular risk based on CVD risk % ≥ 30 or PCVD, with BP measured</p> <ul style="list-style-type: none"> • Mean SBP • Proportion SBP < 130 and/or DBP < 80 • Proportion on: any anti-hypertensive medicine, NPMO

<i>Hypertension (without diabetes or high cardiovascular risk) case management outcomes</i>	<p>Number with hypertension (and no diabetes or high cardiovascular risk) with BP measured</p> <ul style="list-style-type: none"> • Mean SBP • Proportion SBP<140 and/or DBP<90 • Proportion on: any anti-hypertensive medicine, NPMO
<i>Smoking impact outcomes</i>	<ul style="list-style-type: none"> • Number, proportion not smoking in last year • Proportion of smokers at enrolment who are now non-smokers (quit smoking for at least 12 months)
<i>Obesity (abdominal) impact outcomes: waist circumference (excluding current pregnancy)</i>	<ul style="list-style-type: none"> • Mean waist circ. for females/males • Proportion females>90cm/males>100cm
<i>Obesity impact outcomes: BMI (excluding current pregnancy)</i>	<ul style="list-style-type: none"> • Mean BMI • Proportion underweight (BMI <18.5), normal (BMI 18.5-24.9), overweight (BMI 25-29.9) or obese (BMI ≥30) • Proportion of patients with baseline BMI≥25 who are now 18.5-24.9 (in the last year)
<i>Cholesterol impact outcomes</i>	<p>Number, proportion with cholesterol measured</p> <ul style="list-style-type: none"> • Mean cholesterol • Proportion <5 mmol/L
<i>Complications</i>	<ul style="list-style-type: none"> • Number, proportion of complications by category (CVD, cerebrovascular disease, eyes, neuropathy, PVD, renal disease, other) and sub-category (define) • Number, proportion new complications by category (in last year)
<p>Baseline and annually thereafter:</p> <ul style="list-style-type: none"> • Proportion in care by outcome status (Alive and on treatment, dead, MISS, lost to follow-up -- hasn't been seen 6 months after last missed appointment, transfer out) • Proportion in care by diagnosis (DM1, DM2, HTN, DM+HTN, high cardiovascular risk based on Prior CVD (PCVD), PCVD+HTN, PCVD+DM, PCVD+HTN+DM) • Total in care 	
<p>Of those alive and on treatment</p>	

<i>High cardiovascular risk</i>	<p>Number with CVD risk % measured</p> <ul style="list-style-type: none"> • Proportion those with CVD risk % ≥ 30 reduced to 20 to $< 30\%$ (in last year) • Proportion those with CVD risk % 20 to 30% reduced to $< 20\%$ (in last year) • Total proportion those with CVD risk % reduced in last year <p>Number with CVD risk assessed (CVD risk % or PCVD)</p> <ul style="list-style-type: none"> • Number, proportion CVD risk % ≥ 30 (no PCVD) <ul style="list-style-type: none"> ○ Proportion on: statin, low-dose aspirin • Number, proportion PCVD <ul style="list-style-type: none"> ○ Proportion on: statin, low-dose aspirin, anti-hypertensive • Total number, proportion CVD risk % ≥ 30 or PCVD <ul style="list-style-type: none"> ○ Proportion on: statin, low-dose aspirin, anti-hypertensive
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<i>Cholesterol impact outcomes</i>	<p>Number, proportion with cholesterol measured</p> <ul style="list-style-type: none"> • Mean cholesterol • Proportion < 5 mmol/L

Complications

- Number, proportion of complications by category (CVD, cerebrovascular disease, eyes, neuropathy, PVD, renal disease, other) and sub-category (define)
- Number, proportion new complications by category (in last year)