

The United Republic of Tanzania



Ministry of Health and Social Welfare

KAIZEN HANDBOOK
for
Health Facility
Pocket guide for Facilitators

ISBN: 978-9987-737-10-9

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Table of contents

Table of contents	i
Acknowledgement	ii
LIST OF ABBREVIATIONS	iii
Chapter 1: Introduction	1
1-1. Background of KAIZEN implementation in Tanzania	1
1-2. Rational of developing this handbook	2
1-3. How to use this handbook	2
Chapter 2: What is KAIZEN?	3
2-1. What is “Problem”?.....	3
2-2. Levels and composition of “Problems”	4
2-3. What is KAIZEN?.....	6
2-4. Level of KAIZEN.....	7
2-4-1. Small KAIZEN.....	7
2-4-2. Large KAIZEN	8
2-4-3 Management Level of KAIZEN	9
Chapter 3: Practice of KAIZEN with QC story	10
3-1. What is QC story (KAIZEN Process)?.....	10
3-2. Quality Control tools	11
3-3. How to proceed with QC story	14
Step 1:KAIZEN Theme selection	14
Step 2:Situation analysis	17
Step 3: Root cause analysis.....	20
Step 4:Identification of countermeasures	22
Step 5:Implementation of countermeasures	24
Step 6: Checking effectiveness	25
Step 7:Standardization of effective countermeasures.....	27
Chapter 4:Monitoring and Evaluation of KAIZEN Process.....	29
4-1. Who is responsible for M&E of KAIZEN Process?	29
4-2. Ways of coaching WIT in the health facility	29
4-3. Points of monitoring KAIZEN Progress	35
Chapter 5:Hazard Prediction Training (HPT).....	38
5-1. What is HPT?	35
5-2. How to conduct HPT?	36
Conclusive words.....	40
References.....	41
Appendix:	42

Acknowledgement

Provision of full spectrum of quality health services according to needs form one of the three components of the Universal Health Coverage (UHC). Health Facilities (HFs) capability to provide quality health services, requires health workforce with positive attitude, strong teamwork that embraces a culture of continuous improvement, and supported by HFs' culture which ensure organizational learning. The 5S-KAIZEN-TQM approaches are excellent tools in building such environment. Ultimately, Management Teams in HFs will learn and adapt lean thinking and management, which are critical in ensuring efficiency in health service delivery.

The development of this handbook is a result of hard work and collaboration between the Project for Strengthening Development of Human Resource for Health (HRHDP) Secretariat and National Facilitators on 5S-KAIZEN. I would like to thank the Japan International Cooperation Agency (JICA) for funding the development of this handbook and implementation of 5S-KAIZEN-TQM in the country.

The Ministry of Health and Social Welfare (MoHSW) would like to thank Mr. Hisahiro Ishijima for drafting the handbook and later incorporate comments from national facilitators in collaboration with Ms. Nobuko Yamagishi and Mr. Noriyuki Miyamoto.

Also, MoHSW acknowledges contribution of the following national 5S-KAIZEN-TQM facilitators in finalizing the handbook: Dr. Eleuter Samky, Dr. Venance Maro, Regina Kiwoli Nyambo, Stella Stanislaus, Elizabeth Fupe, Romana Sanga, Jamila Hamudu, Salome Saria, Raymond Dibogo and Dr. Humphrey Kiwelu. Sincere appreciation goes to Dr. Eliudi Eliakimu for his editorial work in draft one and pre-final draft of the handbook.

Lastly, the Ministry thanks the entire HRHDP-Secretariat for their tireless efforts in coordinating the review process for the handbook. It is expectation of the Ministry that national facilitators, HFs-Management Teams and Quality Improvement Team (QITs) will use the handbook to strengthen KAIZEN practice in HFs already implementing the approaches. It is the strength of KAIZEN implementation that will lead a HF towards Total Quality Management (TQM) status.



Dr. Mohamed A. Mohamed

DIRECTOR OF HEALTH QUALITY ASSURANCE

List of Abbreviations

AAKCP	Asia Africa Knowledge Co-creation Program
CQI	Continuous Quality Improvement
5S	Sort-Set-Shine-Standardize-Sustain
HPT	Hazard Prediction Training
JICA	Japan International Cooperation Agency
MoHSW	Ministry of Health and Social Welfare
MRH	Mbeya Referral Hospital
OPD	Out-Patient department
PDCA	Plan-Do-Check-Act
PDSA	Plan-Do-Study-Act
QC	Quality Control
QI	Quality Improvement
QIT	Quality Improvement Team
SDCA	Standardize-Do-Check-Act
TQM	Total Quality Management
UHC	Universal Health Coverage
WIT	Work Improvement Team

Chapter 1:

Introduction

1-1. Background of KAIZEN implementation in Tanzania

The three stepwise Quality Improvement approach, 5S-KAIZEN-TQM was introduced in Tanzania in 2007, as part of Asia Africa Knowledge Co-creation Program (AAKCP) initiated by the Government of Japan, through Japan International Cooperation Agency (JICA). AAKCP allowed Asian and African countries to share knowledge and experience, and thereby facilitating the development of country specific Quality Improvement (QI) methods and implementation plans.

Tanzania has participated in AAKCP, and chosen Mbeya Referral Hospital (MRH) as the pilot hospital of the approach. First step, 5S approach was introduced to all national consultant hospitals, specialized hospitals, regional referral hospitals, and some district hospitals since 2008. The first edition of the “Implementation Guidelines for 5S-KAIZEN-TQM Approaches in Tanzania” was produced in 2009. During the scale-up of 5S approach, some hospitals showed good performance in 5S practices, and reached a stage allowing to step up to KAIZEN approach.

MRH was the first hospital that applied KAIZEN approach for problem solving of department level in the hospital. Based on the successful implementation of KAIZEN approach at MRH, the Ministry of Health and Social Welfare (MoHSW) decided to scale up the KAIZEN approach to other hospitals, which had good performance in 5S approach. Related with the movement, MoHSW also revised “Implementation Guidelines for 5S-KAIZEN-TQM Approaches in Tanzania”, in 2011 (producing 2nd edition) to enrich the KAIZEN concepts and approach. The guideline was revised again in 2013 (3rd edition) for betterment of the contents.

MoHSW started training other hospitals on KAIZEN approach since 2011, and as of June 2014, 18 hospitals have been trained on KAIZEN approach (See Appendix). Currently, 68 KAIZEN cases are reported from 7 hospitals. Additionally, 5 African countries (Kenya, Malawi, Nigeria, Sudan, and Uganda) visited Tanzania for observation and learning about KAIZEN practices in hospitals.

1-2. Rationale of developing this handbook

After revision of “Implementation Guideline for 5S-KAIZEN-TQM Approaches in Tanzania, 3rd edition” in 2013, and training of trainers on KAIZEN approach, KAIZEN activities were scaled-up at health facilities. However, insufficient skills and knowledge on KAIZEN implementation were observed among national facilitators and Quality Improvement Team (QIT) members. Therefore, MoHSW conducted three Skill Building Workshop on KAIZEN approach for facilitators and QIT members in collaboration with JICA (first in March 2012 at Muhimbili Orthopedic Institute [MOI], second in 2013 March at Muhimbili National Hospital [MNH] and third in 2014 March at MNH). At the same time, new issues came up and training materials and contents were revised. Moreover, some tools for supportive supervision of KAIZEN activities were also modified. Thus, there was a necessity of developing a book to accommodate new and supplemental issues into the book and provide it to national facilitators, facility managers and QIT members for effective implementation of KAIZEN activities.

1-3. How to use this handbook

This handbook is developed for 5S-KAIZEN facilitators, health facility management and QIT to support KAIZEN implementers in health facilities.

During monitoring of KAIZEN activities in the health facility, mistakes are found in the process of practicing KAIZEN activities or questions are raised about practical implementation of KAIZEN activities. At such time, the use of this handbook together with “Implementation Guideline for 5S-KAIZEN-TQM Approaches in Tanzania, 3rd edition”, will provide technical assistance to KAIZEN implementers, particularly Work Improvement Team (WIT) on:

- Common mistakes found in beginners to practice KAIZEN approach
- Clarification of issues that are frequently asked by implementers
- Check points for monitoring of KAIZEN activities
- Explanation of the issues such as Hazard Prediction Training (HPT), that are not covered in “Implementation Guideline for 5S-KAIZEN-TQM Approaches in Tanzania”

In addition to the above issues covered in this book, MoHSW is expecting all facilitators, health facility management and QIT to utilize this book while conducting internal supportive supervision of QI activities in the health facilities.

Chapter 2:

What is KAIZEN?

In this Chapter, basic issues on quality improvement and KAIZEN approach will be taught on how to take small step first. The objectives of Chapter two are shown in the box below:

- KAIZEN activity starts from sensing and realization of small issues/problems in your work place.
- It is recommended to keep “KAIZEN Memo” as a record of small KAIZEN activities. Record about problems, countermeasures taken and improvement achieved together with pictures.

2-1. What is “Problem”?

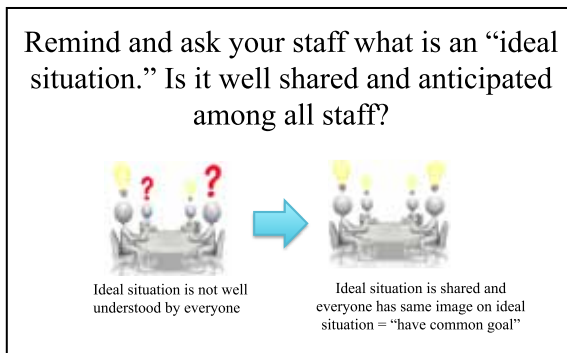
Since KAIZEN approach is defined as “Problem Solving Process” in “Implementation Guideline for 5S-KAIZEN-TQM Approaches in Tanzania”, it is better to know what “problem” is and how we can handle the problem smartly. Then, we will be able to start changing our attitude and take necessary action(s). What is a “Problem”? A “Problem” is defined as “gap between ideal situation and current situation.

Ideal situation – Current situation = “Problem”



Diagram 1: Illustration on “Definition of Problem”

What is the ideal situation of your organization? Is it known and clear to everyone in your organization? Ideal situation of your organization needs to be discussed and agreed among staff. It should meet the needs and expectations of clients and visitors of your services. You should know that needs and expectations of your client are changing from time to time. Therefore, it is very important to have skills and knowledge on how to identify client needs and expectations, which helps you to identify “problem” facing your organization.



2-2. Levels and composition of “Problems”

Definition of problem is clarified. However, we need to understand a few more things about “Problem”. One important thing is that “Problem” is related with various “components/contributing factors”. It means that “problem” is not caused by one factor, and bigger problem has many components or contributing factors that make the problem more complicated. On the other hand, a small problem is easy to solve, as composition/contributing factors are simple to manage.

For example, if you have a problem of “giving wrong medication to in-patients in the ward”, we need to note that there are different types of medicines, and hence need to know which medication was wrongly being given to in-patients. We cannot conclude that all types of medicines are wrongly given as “medication”. It could be injectable medication, oral, ointment, or inhalers.

“Large problem” is composed of several “component factors”

Small problem is simple in composition. Not complicated

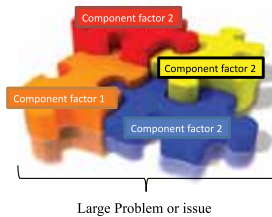


Diagram 2: Component of contributing factors of a problem

It means that the problem is composed of giving wrong “injectable” medicine, giving wrong “ointment”, giving wrong “inhaler medicine” and so on. Thus, we need to categorize medication and understand the component factors.

Another important thing is that there are three types of problem that exist in an organization, which are divided into three levels; 1) Big issues, 2) medium issues, and 3) small issues. Generally, proportion of different levels of problems existing or occurring in the organization is approximately in the ratio of 1:3:6.

Many people like to solve big problems because it draws more attention and is challenging. However, it exists only in 10% (see Diagram 3 below). Starting solving big problems may lead you to getting stuck, because it requires more resources in terms of time and other resources (e.g. money and material etc.)



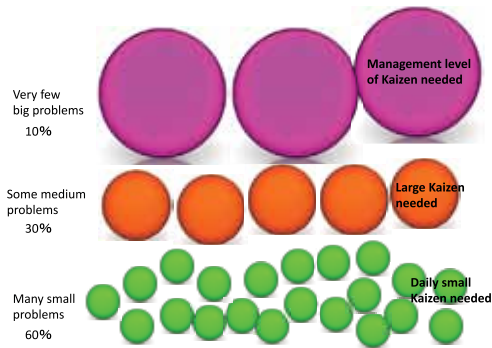


Diagram 3: Three levels of problems / issues

Why don't we work on solving small problems rather than big problems which will make people get stuck, use more energy without making change or solving it? As mentioned above, small problems are not complicated and are easy to solve, so let us change our approach and start working on small problems.

2-3. What is KAIZEN?

People ask, "What is KAIZEN?" The word "KAIZEN" is a Japanese term, which has meaning of "change for better". "KAIZEN" can simply be defined as "Problem Solving Process", and it is the way to make a health facility become a total quality managed facility.

According to a business dictionary, it is defined as; "Japanese term for a gradual approach to ever higher standards in quality enhancement and waste reduction, through small but continuous improvement involving everyone from the head of institution / organization to the lowest level workers".

Some books translate the word "KAIZEN" as "Continuous Quality Improvement (CQI)". However, KAIZEN is more than CQI concept and implementation philosophy applied for "KAIZEN" is also different from CQI. The philosophy applied for KAIZEN is "accumulation of small change". "KAIZEN" does not only implement something for change in innovative way but also KAIZEN can be implemented easily and quickly.

As mentioned in the Diagram 2 above, there are many small problems/issues in your workplace. However, because they are small, they are often ignored or given low priority. Therefore, KAIZEN needs to focus on those small problems, and eliminates them with use of existing resources and minimum inputs.

2-4. Level of KAIZEN

There are many types of KAIZEN. Types of KAIZEN are based on the degree of problems or issues. If you do not know the degree of problem or issue, one may have a wrong approach in implementing KAIZEN, and may take unnecessary action and waste time. Let's look at different types of KAIZEN and how those are implemented.

2-4-1. Small KAIZEN

Small KAIZEN or simple, quick KAIZEN is useful to solve small issues that exist in the workplace. Small KAIZEN does not need many resources and time to improve the situation. Many small issues that exist in the workplace are often ignored as staffs are used to work in such an environment, and forget to recognize small problems/issues as "Problem". Note that the hospitals practicing 5S very well and sustain their 5S activities are often unknowingly practicing small KAIZEN.

One of the effective ways of practicing small KAIZEN is using "KAIZEN suggestion board (see Diagram 4)." KAIZEN topics are usually discussed among Work Improvement Team (WIT) members.



Diagram 4: Example of KAIZEN suggestion board

However, having a meeting for discussion of KAIZEN suggestions / idea is not easy under shortage of staff and high workloads. Therefore, it is recommended to develop KAIZEN suggestion board (see Diagram 4), and let staff feel free to make suggestion of ideas for improvement. Then, section in-charge and WIT make a decision, which will be practiced / implemented, and the progress of small KAIZEN will be shared with other staff using the KAIZEN suggestion board.

- KAIZEN activity starts from sensing and realization of small issues/problems in your work place.
- It is recommended to keep “KAIZEN Memo” as a record of small KAIZEN activities. Record about problems, countermeasures taken and improvement achieved together with pictures.

2-4-2. Large KAIZEN

Large KAIZEN approach is applied to solve complicated problems that need inputs and some other resources. Large KAIZEN requires adequate time to analyze the problem carefully to solve problems and prevent recurrences. One cycle of large KAIZEN is usually 6 months as shown in Diagram 5.

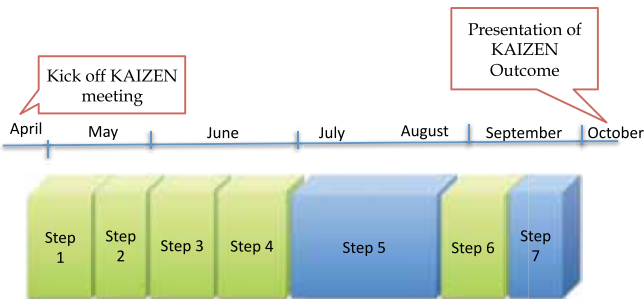


Diagram 5: Example of Large KAIZEN implementation schedule

Time spent for each step is dependent on data collection methods, number of countermeasures to implement, and monitoring of progress by WITs. Details of Large KAIZEN implementation will be explained in Chapter 3.

2-4-3 Management Level of KAIZEN

Problems that are categorized into “Big problem” needs to be tackled by facility management together with higher authorities and other stakeholders. As explained in Diagram 2, a bigger problem is more complicated and many factors are contributing to cause the big problem. It means that solving big problems is not easy and needs more resources as input. Moreover, KAIZEN approach may not be enough to solve the problem, and many need to introduce a completely new mechanism to solve the problem. Before introducing a new mechanism, the same approach that is used for large KAIZEN can be applied for this level of KAIZEN. However, more efforts are needed than large KAIZEN and must be continuously practiced with close follow up. Therefore, it is necessary to pick up a few high contributing factors at the same time, and practice KAIZEN process. If KAIZEN does not show good progress, that is the time now to consider introducing another innovative mechanism.

Chapter 3:

Practice of KAIZEN with QC story

3-1. What is QC story (KAIZEN Process)?

KAIZEN process (also called “Quality Control [QC] story”), is a “problem solving” process for medium issues in your workplace. There are seven (7) steps as follows;

- Selection of KAIZEN theme
- Situation analysis
- Root cause analysis
- Identification of countermeasures
- Implementation of identified countermeasures
- Check effectiveness of the countermeasures
- Standardization of effective countermeasures

The steps are implemented in a stepwise manner as illustrated in Diagram 6. The steps can also be mapped within the PDSA cycle as shown in Diagram 7.

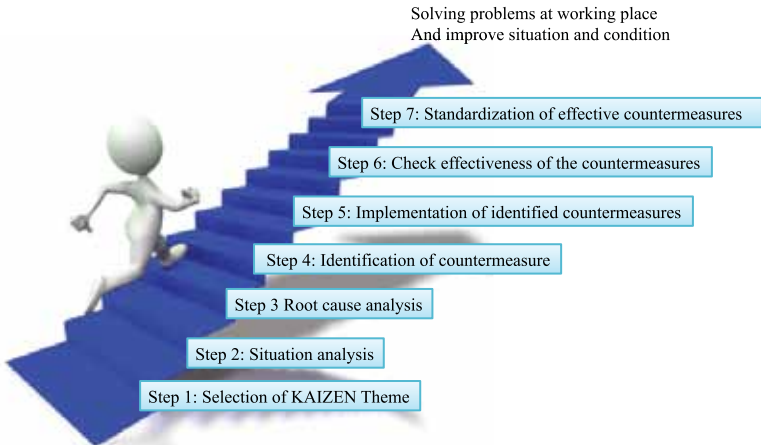


Diagram 6: QC story (KAIZEN Process)

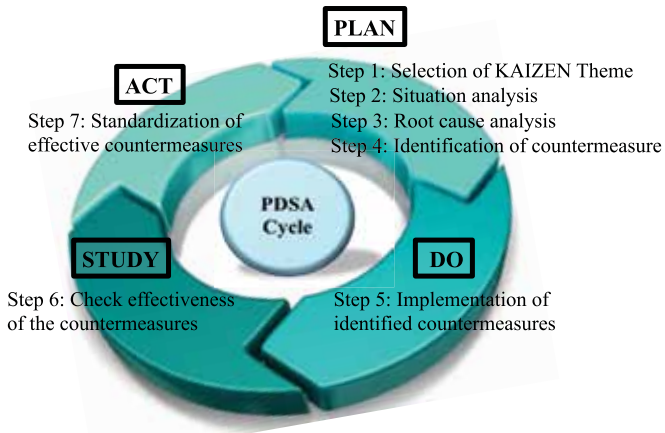


Diagram 7: QC story and the PDSA cycle

QC story is based on the Plan-Do-Study-Act (PDSA) (Diagram 7). This approach does not require WIT members to have in-depth technical knowledge to solve problems. The requirement is simply ideas for improvement and their will to try them. If proposed solutions do not work, the WIT can redesign them and try it again¹.

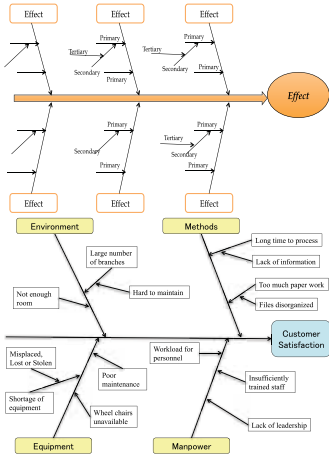
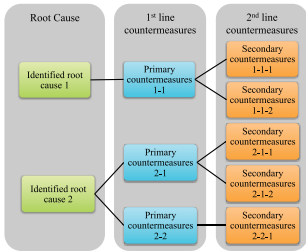
3-2. Quality Control tools

Quality Control tools (QC tools) are applied for KAIZEN approach to carry out the quality improvement from analyzed quantitative and qualitative information. Seven basic QC tools such as Pareto chart and Histogram are used to analyze quantitative data. New QC tools such as Fishbone diagram, Tree diagram, and Matrix diagram are used to analyze qualitative information. Table 1 illustrates the tools and their application in the QC steps.

¹ http://www.apo-tokyo.org/productivity/pmtt_001.htm (Accessed on 10/5/2014)

Table 1: QC tools and their application

QC tools		Step applied and tool's description																																			
<p>Matrix diagram</p> <table border="1"> <thead> <tr> <th rowspan="2">Possible KAIZEN Theme</th> <th colspan="4">KAIZEN Theme selection</th> <th rowspan="2">Score</th> </tr> <tr> <th>Immediate effect</th> <th>Urgency</th> <th>Realization</th> <th>Burden to service users</th> </tr> </thead> <tbody> <tr> <td>Ward space is expanded</td> <td>◆</td> <td>×</td> <td>◆</td> <td>×</td> <td>2</td> </tr> <tr> <td>Giving wrong medications to patients is reduced</td> <td>○</td> <td>○</td> <td>○</td> <td>◆</td> <td>7</td> </tr> <tr> <td>Sampling mistake of laboratory tests is reduced</td> <td>◆</td> <td>◆</td> <td>○</td> <td>○</td> <td>6</td> </tr> <tr> <td>Medicine wastage volume is reduced</td> <td>○</td> <td>◆</td> <td>◆</td> <td>◆</td> <td>5</td> </tr> </tbody> </table> <p>○ : 2 points, ◆ : 1 points × : 0 points</p>		Possible KAIZEN Theme	KAIZEN Theme selection				Score	Immediate effect	Urgency	Realization	Burden to service users	Ward space is expanded	◆	×	◆	×	2	Giving wrong medications to patients is reduced	○	○	○	◆	7	Sampling mistake of laboratory tests is reduced	◆	◆	○	○	6	Medicine wastage volume is reduced	○	◆	◆	◆	5	<p>For Step 1</p> <p>This is one of the new seven QC tools. This tool is used to clarify problems by thinking in a multidimensional way. Relationship among different elements is also clarified.</p>	
Possible KAIZEN Theme	KAIZEN Theme selection				Score																																
	Immediate effect	Urgency	Realization	Burden to service users																																	
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<p>Pareto chart</p>		<p>For Step 2 and 6</p> <p>This is one of the seven basic QC tools. This chart is used for highlighting the most important factors among set of component factors. It helps to prioritize thinking. Software is freely available for its development. Also it has been used successfully in assessing achievements in reduction of problem frequency. Therefore, for simplicity it can be used to complement the role of “control charts”. See Diagrams 9 and 14 for illustration of its development and use in assessing problem frequency reduction respectively.</p>																																			

QC tools	Step applied and tool's description
<p data-bbox="184 151 391 179" style="text-align: center;">Fishbone diagram</p> 	<p data-bbox="643 151 762 179" style="text-align: center;">For Step 3</p> <p data-bbox="482 194 927 382">This is one of the seven basic QC tools. It is used to identify root causes. Clarify cause and effect relation with logical thinking by asking “Why-Because”. Asking “Why-Because” five times may reach to the root cause.</p> <p data-bbox="482 429 927 582">Head of the “Fish” is the “Effect” that is identified from situation analysis and Pareto chart”. The “Effect” in this case is the contributing factors that are causing “Problem”.</p>
<p data-bbox="210 722 365 751" style="text-align: center;">Tree Diagram</p> 	<p data-bbox="643 722 762 751" style="text-align: center;">For Step 4</p> <p data-bbox="482 796 927 1058">This is one of the new seven QC tools. This tool is used to identify countermeasures that need to be implemented to solve identified root causes. Advantage of using tree diagram is that it provides systematic and logical approach, which makes omitting of items less likely. Moreover, it facilitates agreement among team members.</p>

QC tools	Step applied and tool's description																																										
<p style="text-align: center;">Matrix Diagram</p> <p>(Tree Diagram)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Importance</th> <th>Urgency</th> <th>Difficulty</th> <th>Time consumption</th> <th>Resource availability</th> <th>Feasibility</th> </tr> </thead> <tbody> <tr> <td>—</td> <td>3</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>13</td> </tr> <tr> <td>—</td> <td>3</td> <td>2</td> <td>1</td> <td>2</td> <td>1</td> <td>9</td> </tr> <tr> <td>—</td> <td>3</td> <td>2</td> <td>3</td> <td>2</td> <td>1</td> <td>11</td> </tr> <tr> <td>—</td> <td>3</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td>10</td> </tr> <tr> <td>—</td> <td>3</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>6</td> </tr> </tbody> </table> <p>Scale 3 = High priority, easy to do Scale 2 = Moderate Scale 1 = Low priority, difficult to do Scale 0 = Impossible to do</p> <p style="text-align: right; border: 1px solid black; padding: 2px;">Cut off 70% (10,5,15)</p>		Importance	Urgency	Difficulty	Time consumption	Resource availability	Feasibility	—	3	3	3	2	2	13	—	3	2	1	2	1	9	—	3	2	3	2	1	11	—	3	1	2	2	2	10	—	3	1	1	1	0	6	<p style="text-align: center;">For Step 4</p> <p>This is one of the new seven QC tools. This tool is used for checking justification and feasibility of identified countermeasures.</p>
	Importance	Urgency	Difficulty	Time consumption	Resource availability	Feasibility																																					
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<p style="text-align: center;">Table/Checklist</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Countermeasures</th> <th>When</th> <th>Where</th> <th>Who</th> <th>What</th> <th>Why</th> <th>How</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Countermeasures	When	Where	Who	What	Why	How																													<p style="text-align: center;">For Step 5 and 7</p> <p>Action plan or Standardization plan with 5W (When, Where, Who, What, Why) and 1H (How) is useful to understand the action to be taken easily. Checklist to monitor the progress of actions needs to be developed together with the plan.</p>							
Countermeasures	When	Where	Who	What	Why	How																																					

3-3. How to proceed with QC story

Step 1:KAIZEN Theme selection

First step of KAIZEN with QC story is to select a KAIZEN theme. KAIZEN theme is a “Problem” or “Issue” that your section/department is facing, and staff of the section or department would like to reduce the problem for their workplace and its client. KAIZEN theme should be able to implement with existing resources and implemented by the section staff.

KAIZEN theme is:

- = A problem your workplace is facing
- = Something your section wants to improve
- = An unsatisfying issue raised or claimed by clients

Process of selecting KAIZEN theme should be;

- Led by Work Improvement Team
- Done by using brainstorming technique / method in a meeting involving all staff in a particular workplace (eg. ward, laboratory etc.)
- Use matrix to evaluate feasibility (ask ourselves “can we do it?”).

KAIZEN theme is described with:

- Simple sentence containing the basic information of “What” and “Where” it is supposed to be done
- Clarification of the reason for selecting the theme

Examples:

- Time for searching items in the department is reduced
- Mistake on specimen sample collection in the ward is reduced
- Overstock of injectable medicine in the clinic is reduced

Note that action verb must be used. Word “Improve” seems to be OK but we do not know how much you want to “improve”. Therefore, it is better to clarify what you want to do.

Tips for selection of KAIZEN theme are:

- Possible to carry out within own department
- Issue related with everyone in the department
- Possible to solve within 3 to 6 months
- Benefit to own section/ department and its clients

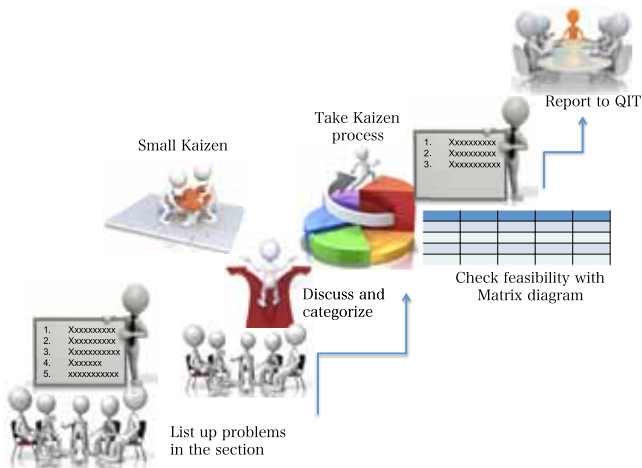


Diagram 8: Kaizen theme selection steps

Table 2: Examples of good KAIZEN theme

	Example of KAIZEN	Section/Department
1	Reduce time wasted in between operating cases in Operating Theaters	Operating Theater
2	Reduce number of inappropriate trays sent to Operating Theater	CSSD
2	Decrease incorrect hand hygiene at Pediatric ward	Pediatric ward
3	Reduce mistakes of handing over between day shift and night shift	Medical ward
4	Reduce time for admission of new patient	Surgical ward
5	Reduce waiting time for X-Ray test	X-Ray
6	Saving costs through proper usage of consumables	Store
7	Improve communication between wards and laboratory	Laboratory

Example of KAIZEN		Section/Department
8	Reduce waiting time for Out patients	OPD
9	Reduce mistakes in claim to National Health Insurance Fund	Account
10	Reduce losing administrative files	Admin

Note that KAIZEN theme that involves many other sections or needs lots of financial, material and human resource are not a good KAIZEN theme at own ward, department, etc. Such themes, when identified, should be suggested to QIT and Facility Management Team for consideration. Target is your work, not others, so select a theme that can be solved within your workplace by you and your co-workers.

Issues that are impossible to solve within department or section, such as break down on infrastructure or machines, serious shortage of resources will need to be discussed with facility management.

Step 2: Situation analysis

KAIZEN theme was selected in the Step 1, and this is equal to the “Problem” of the section or department. As mentioned in the Chapter 2, Diagram 2, different “Contributing factors” compose “Problem”. Therefore, the first process of “Situation analysis” is to brainstorm within WIT on factors that contribute to the “Problem”. After identification of “Contributing factors” to the “Problem”, it is necessary to measure frequency of occurrence of identified “Contributing factors” of the problem. It is important to note that record of step by step of the current process as it is done and not how it would have been done is mandatory, as it will facilitate identification of type of data to be collected.

The following areas need to be carefully checked:

- Knowledge of KAIZEN among team members in relation to KAIZEN theme and its contributing/component factors
- Check if quantitative data are collected appropriately and related with the KAIZEN theme or not
- Data collected are from reliable data source or not
- Proper methodology is used for data collection or not
- Data collection methodology is clearly recorded or not
- Period of data collection is clearly recorded or not

For example;

WIT in OPD agreed that “Problem” of OPD is “Long waiting time to get treatment at OPD”. Then WIT wants to reduce waiting time for patients. The Target is your work not others so select a theme, which can be solved within your workplace by co-workers. KAIZEN theme of OPD will be “Patients waiting time at OPD is reduced”.

Now, it is necessary to brainstorm on contributing factors to the “Problem” = “Patients are waiting for long time to get treatment at OPD”. You may identify contributing factors of the “Problem” as following components:

- Many patients coming at same time
- Health workers are not coming on time
- Morning report is prolonged
- Staff allocated at OPD were less than required

Then, WIT needs to collect quantitative information on the above factors for one to two months as follows:

- Number of days OPD waiting area was congested first in the morning
- Number of days staff did not come on time
- Number of days morning report was prolonged
- Number of days staff were allocated less than required

Date of data collection and methodology such as interview, questionnaires, direct observation and measuring time, etc. needs to be recorded for Step 6 as it is necessary to compare the improvement between before and after KAIZEN. After collecting the information, data must be analyzed. It is necessary to develop calculation table for cumulative frequency and its ratio. Then, “Pareto chart” needs to be developed based on the table.

Many people often make mistakes in developing “Pareto chart” particularly to set a scale for frequency (On the left side of Pareto chart). Ideally, highest frequency of contributing factors equals to the highest scale. In some tools for making Pareto chart, extra 5 to 10% of highest frequency is added. Cut off point line at level of 80% is also often forgotten to display and plotting of cumulative ratio is not plotted properly.

Issue	Frequency (Descending order)	Cumulative Frequency	Cumulative Ratio
Giving wrong medication			
Contributing factors			
Wrong injectable	35	35	0.51
Wrong inhaler	20	55	0.80
Wrong oral medicine	8	63	0.91
Wrong volume of insulin	4	67	0.97
Wrong ointment	2	69	1.00
Total	69		

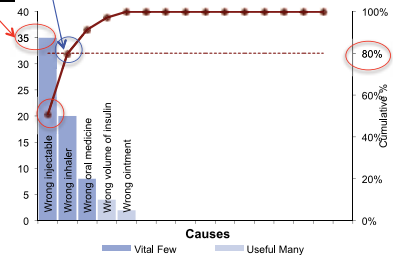


Diagram 9: How to develop Pareto chart

Target setting for KAIZEN

Target for achievement of KAIZEN activity needs to be set. Target should be set based on the result of the situation analysis and performance level of the section. “What to improve”, “By when need to be achieved” and “How much should be improved or reduced”, etc. It is better not to be so ambitious for target setting.

The following points need to be checked carefully:

- Calculation of cumulative frequency and ratio
- Pareto chart scale for frequency (defect)
- Cut off point at 80% line
- Plotting of cumulative ratio and match with scale
- Target setting
- Prioritization of component factors for next step

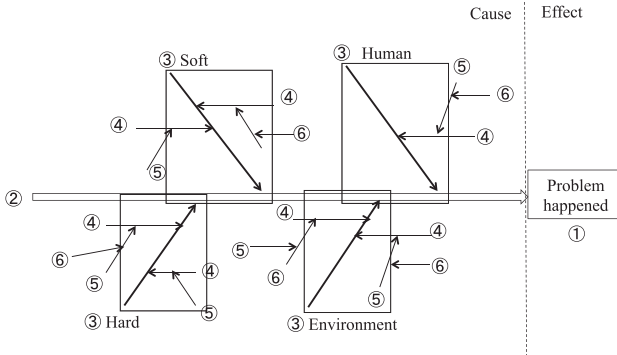


Diagram 11: How to draw fishbone diagram

How to draw Fishbone diagram:

- Write the contributing factor to the problem to be solved as descriptively as possible on right side
- Draw the “backbone of the fish”
- Categorize the causes
- Answer the question “Why? - Because” to identify root causes
- Answer the question “Why? - Because” again
- Answer the question “Why? - Because” again

Note: Asking “Why?” five times, successfully, you can drive into a problem deeply enough to understand the ultimate root cause.

WIT must start tackling from “the contributing factors with highest frequency”. If two defects (contributing factors) account for 80% (cut off point), we have to develop Fishbone diagram for each defect.

Tips for asking “Why-because” to identify root causes

- Have positive mindset and humble. Stop blaming others
- Resources are limited. If you start analyzing by talking about lack of funds, human resources, and equipment, these are not going to help you to find the root cause. Categories of factors (Life, Soft, Hard, Environment) can be adjusted based on the nature of issues, set on “Head of fish”
- Think of “we might have some problem”, “system is not functioning

- well”, “Way of doing thing is not right”
- Ask “Why-because” at least 5 times to get root cause for each category of factors
- More breakdown of cause will make implementation easier to enable to solve existing problems
- Always have in mind the processes noted during situation analysis (step 2) in finding answers to the why-because

Step 4: Identification of countermeasures

In this step, it is necessary to understand how to identify countermeasures using Tree diagram and evaluate feasibility using Matrix diagram.

We often see that second line countermeasures are not well identified, and connection among countermeasures is also not clear. Thus, those points need to be carefully observed and provided with technical inputs for proper identification of countermeasures.

After identification of countermeasures, feasibility needs to be checked with Matrix diagram. For example, “conduct training” was identified as 1st line countermeasure. Then, 1) develop training materials, 2) conduct a training session, and 3) monitoring and mentoring of trained staff, were identified as second line countermeasures. Then, feasibility was checked for those 3 activities using Matrix diagram. However, only “conduct a training session” got high mark and judged as feasible. Then here comes a question. Is it possible to conduct a training session without teaching materials? Answer is NO. Need to have handouts for training.

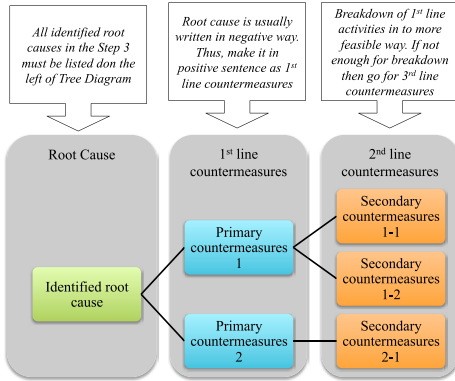


Diagram 12: Identification of countermeasures

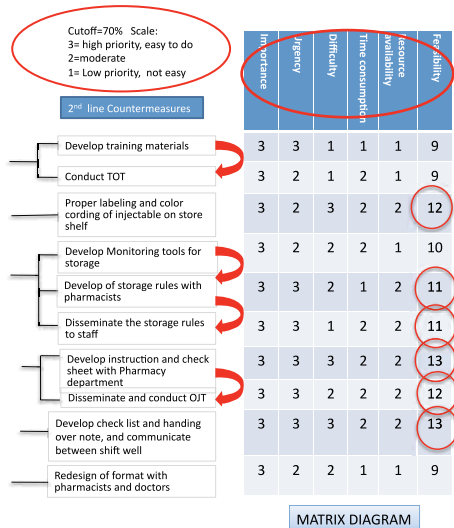


Diagram 13: Using Matrix to check feasibility

We often observe that scale for marking and cut off line were not mentioned near the Matrix diagram. This is very important to make understanding of which countermeasures are selected as feasible. Moreover, remind WIT members to put red circle on the feasibility score to help staff to visualize feasible countermeasures easily.

The following points need to be carefully checked in this Step:

- All identified root causes in Step 3 are reflected in Tree Diagram or not
- Detailed countermeasures are identified or not; breakdown of countermeasures by the level of countermeasures
- Feasibility is appropriately done or not; Check the relation among the identified countermeasures against a root cause
- Scale and cutoff point of feasibility check are clarified or not

Step 5:Implementation of countermeasures

All countermeasures identified in Step 4 are accommodated into action plan for implementation of countermeasures. The action plan is developed using 5W (When, Where, Who, What, Why) and 1H (How) method to clarify key issues. A checklist must be developed to monitor the progress of countermeasures implementation and timeframe.

Both action plan and checklist need to be displayed where all staff can see and access. This is very important to remind staff to implement identified countermeasures within the given timeframe.

The following points need to be carefully checked:

- All countermeasures identified should be carried out within the section/unit
- Action plan is developed based on “5W1H” concept
- Checklist for monitoring of progress is developed
- Appropriate time for implementation of countermeasures is indicated

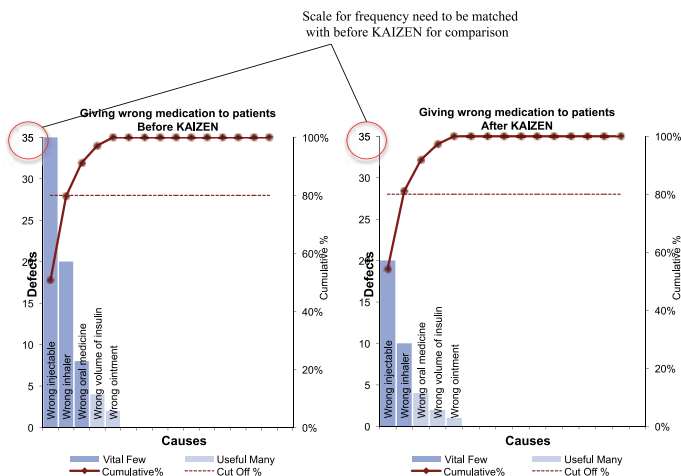
Step 6: Checking effectiveness

Data collection

In this step, same data collected in Step 2 need to be collected again for comparison of data to see the effectiveness of KAIZEN activities implemented in Step 5.

- Therefore facilitators need to ensure the following points in Step 6:
- Necessary data is collected for effectiveness, check if it is the same methodology and period applied in Step 2
- Compare table for effectiveness, check if it is developed or not
- Pareto Charts for before and after KAIZEN are developed based on the comparison table or not

Same scale of frequency needs to be applied on Pareto chart of before and after KAIZEN. Plotting points of cumulative ratio also need to be checked.



**Diagram 14: Use of Pareto Chart to check effectiveness
(Reduction of problem frequency)**

Another important thing to check is identification of effective countermeasures and other effects.

Table 3: Relationship between Countermeasures and Effectiveness

		Effectiveness	
		Effective	Not effective
Countermeasures	Implemented	It is effective and need to be standardized	It is not effective and need to review measures
	Not implemented	Need to clarify why it is effective	Implement some measures (DO something)

Whatever the results are, it is necessary to clarify the relationship between countermeasures and effectiveness as shown in Table 3.

- Effectiveness should be measured by each countermeasure
- The countermeasure that is not implemented but shows some good effects need to be investigated to identify the reason.
- The countermeasure that is not implemented and hence cannot measure effectiveness need to be implemented.
- It is necessary to review countermeasures if they are not effective.
- The countermeasures that were implemented and judged as “effective” will be standardized in Step 7.
- The countermeasures may cause bad effects. If bad effects are greater than effectiveness, it is necessary to review the countermeasures.

Note that effectiveness can be categorized into;

Tangible effects - Expected outcome

Ripple effects - predicted outcome

Intangible effects - unexpected outcome

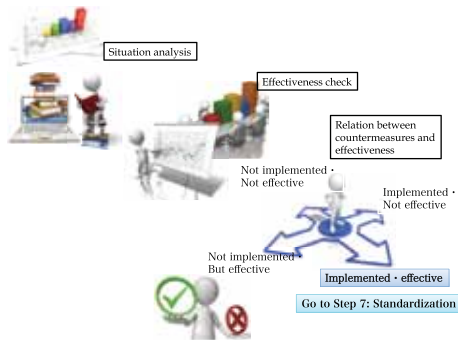


Diagram 15: Process of Step 6, effectiveness check

Step 7: Standardization of effective countermeasures

Why Standardization is so important?

Main purpose of this step is to maintain good results of KAIZEN to prevent recurrence of tackled problems.

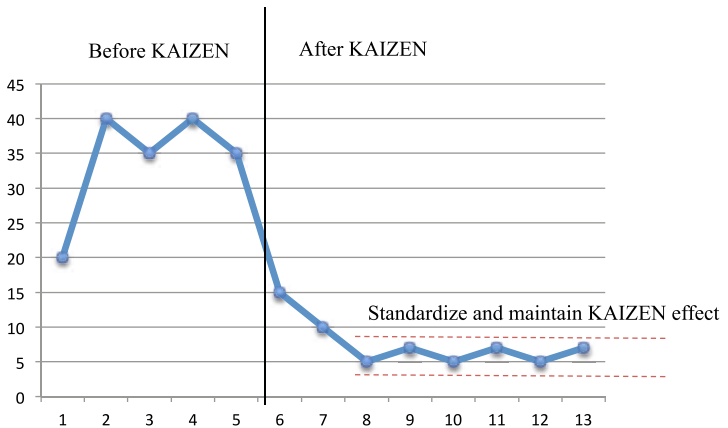


Diagram 16: Standardization of good effect

QC Story is often described as same as PDCA (PDSA) cycle. However, Step 7 makes KAIZEN more than PDCA (PDSA). Step 7 adds another cycle called Standardize-Do-Check-Act (SDCA) cycle to ensure continuation of effective measures to prevent fallback.

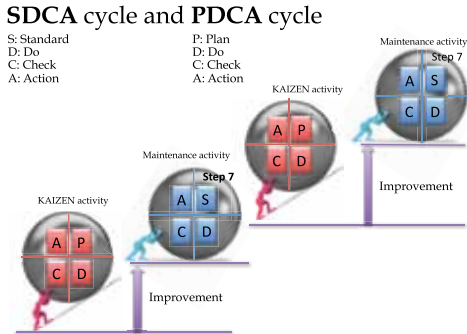


Diagram 17: PDCA + SDCA = KAIZEN

The following points need to be carefully checked in this Step:

- all effective countermeasures are reflected on standardization plan or not
- Standardization is developed based on “5W1H”
- If monitoring checklist for standardized activities is developed and used or not
- Standardization plan is shared with all staff working in the section/unit

All countermeasures identified, as “effective measure” must be listed on the left end of Standardization plan. The style of Standardization plan is the same as action plan, which was developed in Step 5. Use 5W1H to clarify the activities for sustainable manners. After development of Standardization plan, there must be a mechanism to continue practicing effective measures to prevent fallback. We often see that majority of WITs, when they complete Step 6, they start relaxing and forget taking Step 7. As facilitator, member of Management Team or QIT, we need to remind them to implement Step 7.

Chapter 4:

Monitoring and Evaluation of KAIZEN Process

4-1. Who is responsible for M&E of KAIZEN Process?

Responsible person for the KAIZEN M&E in the health facility is Quality Improvement Team (QIT). Therefore, QIT members need to be knowledgeable and skillful on KAIZEN process, usage of tools, and record keeping.

4-2. Ways of coaching WIT in the health facility

Based on the experiences from different health facility practicing KAIZEN, periodical technical inputs from QIT are needed to WIT at different sections. There seems to be different ways of communication between QIT and WIT. The way you communicate with WIT in the facility needs to be agreed and practiced regularly. The following should be done for successful coaching of the WIT:

- Periodical visit to sections and provide technical advices
- Welcome WIT to QIT office for consultation
- Check process and work done before moving to next step in QC story
- Use checklist to monitor the progress and visualize results for consultation
- Progress presentation sessions by WITs arranged by QIT where sharing of experience is also done

4-3. Points of monitoring KAIZEN Progress

The checklist attached here is for monitoring the progress of KAIZEN implementation and weakness in data collection, use of QC tools, analysis, record keeping, etc. Points to check on the checklist are the issues that people often make mistakes or wrongly practiced. Therefore, using this checklist will help you to remind WIT members where they need to be more careful during the implementation of KAIZEN.

KAIZEN Supportive Supervision Checklist

Date
Unit

		<i>Points to check</i>	<i>Yes</i>	<i>No</i>	<i>Date of check</i>	<i>Check by</i>
Sample		Staff are committed to practice KAIZEN or not	✓			Jane
Before KAIZEN	1	Ask number of WIT members				
	2	Check problem statement of the section/unit				
	3	Check the date of the KAIZEN case started				
Step 1	4	Check whether they have selected the theme which can be solved within the section/unit or not				
	5	Check whether the KAIZEN theme was selected with Matrix Diagram				
	6	Check whether the scale of feasibility is clarified or not				
	7	The KAIZEN theme is written in “positive manner”				

		<i>Points to check</i>	<i>Yes</i>	<i>No</i>	<i>Date of check</i>	<i>Check by</i>
Step 2	8	Check whether appropriate quantitative data collected relate with the KAIZEN theme or not				
	9	Check whether WIT members understood well relation between the KAIZEN theme and contributing factors or not.				
	10	Check whether data source is appropriate or not				
	11	Check whether data collection method is appropriate or not				
	12	Ask the period of data collection and check if it is appropriate or not				
	13	Check whether all the records were kept for data collection or not				
	14	Check whether compilation of the data, calculation of cumulative frequency and ratio was done properly by using table or not				
	15	Check whether Pareto Chart is properly developed based on the table or not; Need to check the scale, Plotting point of cumulative ratio, Description of contributing factors)				
	16	Check whether the target setting is done or not				

		<i>Points to check</i>	<i>Yes</i>	<i>No</i>	<i>Date of check</i>	<i>Check by</i>
Step 3	17	Check whether prioritized problem / contributing factors that were identified in Step 2 is used as a head of Fishbone or not				
	18	Check whether contributing factor in the head of Fishbone Diagram is stated in sentence; Why (the contributing factor) happened?				
	19	Check whether “Cause-Effect (Why-Because)” relation is clarified or not				
	20	Check whether “Why-Because” is asked enough to find root causes or not				
	21	Check whether sentence used in the Fishbone Diagram are clearly stated or not				
	22	Check whether “No money”, “No human resource” and “No material” are not identified as a root cause				
Step 4	23	Check whether all the identified root causes in Step 3 is reflected in Tree Diagram or not				
	24	Check whether detailed countermeasures are identified or not; breakdown of countermeasures by the level of countermeasures				
	25	Check conflict of activities among identified countermeasures				
	26	Check whether feasibility is appropriately done or not; Check the relation among the identified countermeasures against a root cause				
	27	Check whether the scale and cutoff point of feasibility check are clarified or not				

		<i>Points to check</i>	<i>Yes</i>	<i>No</i>	<i>Date of check</i>	<i>Check by</i>
Step 5	28	Check whether all countermeasures identified are possible to carried out within the section/unit or not				
	29	Check whether all feasible countermeasures are reflected in the action plan				
	30	Check whether the action plan are developed based on “5WH”				
	31	Check whether monitoring checklist is developed or not				
	32	Check whether appropriate timing is given to implement all countermeasures or not				
Step 6	33	Check whether all necessary data is collected for effectiveness check or not; same methodology and period applied in Step 2				
	34	Check whether comparison table for effectiveness check is developed or not; Frequency before and after KAIZEN, cumulative number frequency before and after KAIZEN, Cumulative ratio before and after are appropriately calculated or not in the comparison table				
	35	Pareto Charts for before and after KAIZEN are developed based on the comparison table or not; Scale of frequency, Cumulative ratio, Plotting points of cumulative ratio				
	36	Check whether Pareto Chart is properly developed based on the table or not; Need to check the scale and scale adjustment between before and after the KAIZEN, Plotting point of cumulative ratio, Description of contributing factors)				
	37	Check whether effective countermeasures are identified and listed or not				
	38	Check whether ineffective countermeasures are identified and listed or not				

		<i>Points to check</i>	<i>Yes</i>	<i>No</i>	<i>Date of check</i>	<i>Check by</i>
Step 7	39	Check whether all effective countermeasures are reflected on standardization plan or not				
	40	Check whether standardization is developed based on “5W1H”				
	41	Check whether a monitoring checklist for standardized activities is developed and used or not				
	42	Check whether standardization plan is shared with all staff working in the section/unit				
Common Issues	43	After completion of one KAIZEN case, check whether discussion and action are taken for next KAIZEN case or not				
	44	Check whether all records of KAIZEN process are kept properly or not				
	45	Check whether starting and completing period of each KAIZEN step is clearly recorded or not				
	46	Check whether All KAIZEN process is planned to complete within 6 months or not; check existence of implementation schedule				
	47	Observe knowledge and skills of using QC tools among staff				
	48	Check whether staff are understanding purpose of each KAIZEN step or not				
	49	Check frequency of communication between QIT and KAIZEN members on the KAIZEN case				
	50	Check the evidences of countermeasures of the KAIZEN case, for example Training manuals, SOPs, Training report and so on				

Chapter 5:

Hazard Prediction Training (HPT)

5-1. What is HPT?

Hazard Prediction Training (HPT) was originally developed and introduced in industrial sector to prevent work-related accidents in Japan in 1970s. It is now widely used in the several fields, e.g., manufacturing, construction sites, healthcare services (including nursing care for the aged), driving school, primary school, etc.

Through HPT it is possible to enhance the following issues:

- Enhance your sensitivity to hazards/risks
- Improve occupational health and safety
- Cultivate leadership skills
- Improve problem-solving skills of staff
- Promote teamwork

Principles of HPT are as follows:

- ZERO accidents and hazards
 - Eliminate accidents and hazards in daily life
 - Assure safety and health of internal/external clients
- Anticipation
 - Learn from small “near-accidents” (referring to a situation in which accidents did not actually occur, but could have resulted in accidents) and act on them before fatal accidents occurred. There are hundreds of “near-accident” that occur and leave no injuries, while one accident happens and cause fatalities.
- Everyone’s Participation
 - Leadership is the key for safety management (Top down)
 - Voluntary efforts of staff at field (Bottom up) are very important

5-2. How to conduct HPT?

HPT use Four (4) Round Methodology which are briefly explained below:

1st Round

Identify potential hazards in the situation

2nd Round

Identify vital hazards

Narrow down the hazards and select the vital hazards.

3rd Round

Develop preventive measures

Discuss possible countermeasures to prevent the identified hazards

4th Round

Select the most important measures as a target and identify it among the team

Note that preventive measure should not be mixed up with countermeasures. Countermeasure is “to take action” on something that has happened. However, Preventive measure is “to take action” against something that might happen or remove risk factors, or possibility of danger.

When you are conducting HPT, the following issues need to be checked properly:

- Appropriate number of one group: 5-6 members apart from the leader
- Select a leader and a recorder before you start
- Prepare photos/illustrations, HPT sheets, black and red pens
- Continuous HPT reduces human errors
- Don't spend much time (max 15 minutes)
- Good exercise for medical attendants, cleaners and other non-medical staff as well
- Use your imagination and experiences

Tips for implementation of each round

1st Round: Identify potential hazards in the situation

- List up the followings as much as possible:
- Risk factors (condition or behavior which may cause accidents)
- Accidents which may be caused by them
- Describe them as "Cause-and-Effect". e.g. Since ----- (Risk factors), ----- (Accidents) happens.
- Be specific and concrete

HPT Sheet

Date: / /

Leader: _____

Members:

No.	Risk factors	Accidents/incidents
1		
2		
3		
4		
5		
6		
Significant dangers	Preventive Measures	

Diagram18 : Example of HPT sheet

2nd Round: Identify the vital hazards

- Mark significant hazards with □ according to its probability and seriousness
- Mark the most significant hazards with □ by common consent
- Consider the background as well (Why the situation was like that? Why he/she behaves so?)

3rd Round: Develop preventive measures

- Discuss possible countermeasures to prevent the accidents identified in Round 2
- Preventive measures should be specific and feasible
- Describe them in positive phrase, not use negative phrase

4th Round: Set the target

- Select the most important and feasible measures by common consent
- Selected one is the target of the team to prevent accidents/incidents
- Point the finger to the selected measures and repeat out loudly

HPT Sheet

Date: 28 / 7 / 2012

Leader: John (MD)




Members: Mpinde (MD), Kombo (HA), Martin (RN)

No.	Risk factors	Accidents/incidents
1	The ladder is standing against piled boxes and it is sliding, therefore,	the staff loses his balance and falls off the ladder when he climbs up.
2	Since many boxes are piled on the top shelf,	the boxes falls down when he touches them and hits him on the head.
3	A staff tries to pile up a box to the top of the shelf and the box is very heavy, therefore,	he hurts his back.
4	Since he climbs down the ladder without looking behind,	he stumbles on the bucket and falls
Significant hazards	Preventive Measures	
2	<ul style="list-style-type: none"> • Arrange all the items properly and make a space • Keep the boxes in order • Do not pile the boxes on the top shelf • Set the highest level of piling boxes and arrange the boxes under the level • 	

Diagram 19: Example of how to fill in HPT sheet

Walk around your health facility with digital camera and try to find dangerous situation and take photos for development of HPT training materials. You will find lots of unsafe practices. Just take a photo before giving advices for improvement.

Table 4: Example of Illustrations for Use during HPT

Examples of Photos	Description of Situation
<p data-bbox="111 197 623 225">Prepare photos/illustrations for HPT like this</p> 	<p data-bbox="657 197 761 225">Situation</p> <p data-bbox="657 239 937 396">In a health facility ward. Patient came out from toilet, and nurse is disposing something into waste bin.</p>
<p data-bbox="111 535 623 564">Prepare photos/illustrations for HPT like this</p> 	<p data-bbox="743 535 847 564">Situation</p> <p data-bbox="657 578 937 668">In a health facility store. Staff is trying take out a box from shelf.</p>
<p data-bbox="111 896 623 925">Prepare photos/illustrations for HPT like this</p> 	<p data-bbox="743 896 847 925">Situation</p> <p data-bbox="657 939 937 1001">Passage in one health facility.</p> <p data-bbox="657 1021 937 1143">Many people are passing by. Oxygen cylinders are kept without any notification or instruction.</p>

Conclusive words

This document was developed for the KAIZEN facilitators and member of Health Facility Management Team and QIT, at all levels who are providing technical inputs to WIT members for effective implementation of KAIZEN activities.

Many people feel that KAIZEN is difficult to practice. However, ordinary ways of problem solving that was used in the past may not bring much change and problems will remain as they are, and resources will continuously be wasted.

The word “KAIZEN” means, “Change for the better”. First thing we need to do is having positive mindset for changing the current situation for better. WIT members need to change their mindset in a positive way, and use their wisdoms to make work process and service contents better for improvement of client satisfaction. Therefore, it is necessary to explain and convince WIT members that there is nothing to be afraid of in implementing KAIZEN. Even when KAIZEN process are taken wrongly, WIT has chances to try again or start over at any step.

KAIZEN is the way to manage workplace and facilities in cost effective and productive manner by impacting a culture of lean management and thinking. Therefore, this concept and approach need to be well understood and adopted by health facility managers and health workers. KAIZEN if effectively practiced will make health facilities able to provide high quality care to the people of Tanzania.

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Appendix: List of Hospitals Trained on KAIZEN

#	Name of hospitals
1	Mbeya Zonal Referral Hospital
2	Kilimanjaro Christian Medical Center
3	Bugando Medical Center
4	Muhimbili National Hospital
5	Amana Regional Referral Hospital
6	Mwananyamala Regional Referral Hospital
7	Iringa Regional Referral Hospital
8	Tumbi Regional Referral Hospital
9	Singida Regional Referral Hospital
10	Rukwa Regional Referral Hospital
11	Morogoro Regional Referral Hospital
12	Songea Regional Referral Hospital
13	Tosamaganga Designated District Hospital
14	Mugana Designated District Hospital
15	Mirembe Hospital
16	Muhimbili Orthopedic Institute
17	Kibong'oto Hospital
18	CCBRT (Comprehensive Community Based Rehabilitation in Tanzania)

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