



United Republic of Tanzania

Ministry of Health, Community Development, Gender, Elderly and Children

Implementation Guideline on 5S-KAIZEN-TQM Approach in Tanzania

“The path to Total Quality Managed Hospital”

4th edition

December 2019

ISBN:978-9987-797-41-3

Table contents

ACRONYMS	iii
FOREWORD	iv
ACKNOWLEDGEMENT	vi
CHAPTER 1: QUALITY IMPROVEMENT ACTIVITIES IN TANZANIA	1
1.1. BACKGROUND.....	1
1.2. QUALITY IMPROVEMENT IMPLEMENTATION STRUCTURE IN TANZANIA	1
1.2.1. <i>Current situation of Quality Improvement activities in Tanzania</i>	1
1.2.2. <i>Team formulation for Quality improvement in the health facility</i>	1
1.3. CHALLENGES IN QUALITY IMPROVEMENT IN TANZANIA	2
1.4. STRATEGIES FOR QUALITY IMPROVEMENT	2
1.4.1. <i>Strengthening the teams for QI at health facility</i>	2
CHAPTER 2: 5S-KAIZEN-TQM APPROACH IN TANZANIA	7
2.1. HISTORY OF 5S-KAIZEN-TQM APPROACH IN TANZANIA	7
2.2. LESSONS LEARNED FROM PAST EXPERIENCES	7
2.2.1. <i>Domains for successful national rollout of 5S-KAIZEN-TQM</i>	8
2.2.2. <i>National Facilitators of 5S-KAIZEN-TQM Approach</i>	11
2.2.3. <i>Roles and responsibility of the national facilitators</i>	11
2.2.4. <i>Health facilities implementing 5S-KAIZEN activities</i>	13
CHAPTER 3: QUALITY AND SAFETY IN HEALTHCARE SETTINGS	14
3.1. QUALITY AND SAFETY IN HEALTHCARE	14
3.2. “PROBLEM” IN HEALTH CARE SETTINGS	15
3.2.1. <i>What is Problem?</i>	15
3.2.2. <i>Level of Problem</i>	15
3.3. BASIC CONCEPTS OF QUALITY	17
3.3.1. <i>Definition of quality</i>	17
3.3.2. <i>Differences among QC, QA, QI and QM</i>	18
3.3.3. <i>Dimension of quality</i>	19
3.3.4. <i>Domain of successful quality intervention</i>	19
3.4. “SEVEN WASTES” IN RELATION TO QUALITY IMPROVEMENT.....	21
CHAPTER 4: SAFETY IMPROVEMENT	23
4.1. DEFINITION OF PATIENT SAFETY	23
4.1.1. <i>Recommendation to improve patients’ safety</i>	23
4.2. DEFINITION OF STAFF SAFETY	23
4.2.1. <i>Recommendation to improve staff safety</i>	23
4.3. HAZARD PREDICTION TRAINING (HPT)	24
4.3.1. <i>Objectives of HPT</i>	24
4.3.2. <i>HPT Principles</i>	25
4.3.3. <i>What HPT can do for health sector?</i>	25
4.3.4. <i>How to conduct HPT</i>	25
4.3.5. <i>Tips for successful implantation of HPT</i>	26
CHAPTER 5: BASIC CONCEPT OF THE 5S-KAIZEN-TQM APPROACH	30
5.1. CONCEPT OF TOTAL QUALITY MANAGED (TQM) HOSPITAL	32
5.2. 5S-KAIZEN-TQM APPROACH TOWARD TQM HOSPITAL	32
5.3. THE 5S APPROACH.....	33
5.3.1. <i>What is the 5S?</i>	33

5.3.2.	<i>Targets of 5S activities</i>	34
5.3.3.	<i>Setting targets of the 5S activities</i>	34
5.3.4.	<i>Implementation of the 5S activities</i>	36
5.3.5.	<i>Introduction stages (preparatory and introductory phases) of the 5S approach</i>	36
5.3.6.	<i>Situation analysis before introducing the 5S-KAIZEN-TQM approach</i>	38
5.3.7.	<i>How to conduct in-house training</i>	40
5.3.8.	<i>Practice of the 5S activities</i>	40
5.4.	KAIZEN APPROACH	48
5.4.1.	<i>History of KAIZEN approach</i>	48
5.4.2.	<i>Difference between KAIZEN and Continuous Quality Improvement</i>	48
5.4.3.	<i>KAIZEN concepts</i>	48
5.4.4.	<i>Preparation for problem solving</i>	49
5.4.5.	<i>Types of KAIZEN</i>	49
CHAPTER 6: USEFUL TOOLS FOR 5S ACTIVITIES		72
6.1.	USE OF TOOLS FOR 5S ACTIVITIES	72
6.1.1.	<i>Ergonomics and tools for 5S</i>	76
6.2.	VISUAL CONTROL	76
6.2.1.	<i>What is “Visual control”?</i>	76
6.2.2.	<i>How Visual control works in health facility?</i>	77
6.2.3.	<i>Useful concept for 5S activities</i>	78
6.2.4.	<i>Two-bin inventory control system for Just in Time (JIT)</i>	79
6.2.5.	<i>Benefits of using visual control in the workplace</i>	80
CHAPTER 7: M& E OF 5S-KAIZEN-TQM ACTIVITIES		81
7.1.	INTRODUCTION.....	81
7.2.	WHAT IS MONITORING AND EVALUATION?	81
7.3.	WHY M&E IS NEEDED?.....	82
7.4.	TYPE OF M&E ACTIVITIES IN THE HEALTH FACILITY FOR 5S-KAIZEN-TQM	82
7.4.1.	<i>Self-monitoring</i>	82
7.4.2.	<i>Internal M&E activities</i>	82
7.4.3.	<i>External M&E activities</i>	82
7.5.	HOW M&E FOR 5S-KAIZEN-TQM ACTIVITIES ARE CONDUCTED AT DIFFERENT LEVELS	83
7.5.1.	<i>National level</i>	83
7.5.2.	<i>Regional level</i>	83
7.5.3.	<i>District level</i>	84
7.6.	TOOLS FOR M&E OF 5S-KAIZEN-TQM ACTIVITIES	85
7.7.	RECOGNITION AND COMPETITIONS	85
7.7.1.	<i>Implementation of recognition and competition scheme at health facility</i>	86
7.7.2.	<i>Implementation of recognition and competition scheme at national level</i>	86
ANNEX		87
ANNEX 1: 5S-KAIZEN MONITORING & EVALUATION SHEET.....		87
ANNEX 2: QIU/QIT FUNCTION CHECK SHEET		96
ANNEX 3: KAIZEN PROGRESS CHECK SHEET		100
ANNEX 4: KAIZEN SUPPORTIVE SUPERVISION CHECKLIST.....		102

Acronyms

AAKCP	Asia Africa Knowledge Co-Creation Program
BMC	Bugando Medical Center
BRN	Big Result Now initiative
CCHP	Comprehensive Council Health Plan
CHMT	Council Health Management Team
CHOP	Comprehensive Hospital Operation Plan
CQI	Continuous Quality Improvement
CV	Consultation Visit
DCS	Department of Curative Services
DHQA	Department of Health Quality Assurance
DPP	Department of Policy and Planning
EHPA	External Hospital Performance Assessment
HMT	Hospital Management Team
ISS	Internal Supportive Supervision
JICA	Japan International Cooperation Agency
KCMC	Kilimanjaro Christian Medical Center
MNH	Muhimbili National Hospital
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MZRH	Mbeya Zonal Referral Hospital
PPM	Planned Preventive Maintenance
PORALG	President Office, Regional Administration and Local Government
QA	Quality Assurance
QC	Quality Control
QI	Quality Improvement
QP	Quality Planning
QIU	Quality Improvement Unit
QIT	Quality Improvement Team
QM	Quality Management
QPR	Quarterly Progress Report
RRHMP	Regional Referral Hospital Management Project
RMSS -C	Regional Managed Supportive Supervision for Council
RMSS -H	Regional Managed Supportive Supervision for Hospital
RHMT	Regional Health Management Team
RRHMT	Regional Referral Hospital Management Team
SBM-R	Standard Based Management and Recognition
TPS	Toyota Production System
TQM	Total Quality Management
TQIF	Tanzania Quality Improvement Framework
WIT	Work Improvement Team

Foreword

The development of “Fourth Edition of the “Guideline for Implementation of 5S-KAIZEN-TQM Approaches in Tanzania” has come at an opportune time when the overseeing of the Regional Referral Hospitals (RRHs) has been officially moved from TAMISEMI to Ministry of Health Community Development Gender Elderly & Children (MoHCDGEC). The main objectives of the transfer of the RRHs to the ministry were:

- Improving quality of specialized health care delivery at regional level; and
- Strengthening of referral system with a view to provide affordable quality health care to patients at regional level.

In this understanding, the need for the review of the “Third Edition” were stirred not only by the change of overseeing and ensuring the RRHs under MoHCDGEC achieve the government aspired objectives mentioned above, but also, goaded by: experiences gathered during several 5S-KAIZEN supervisions (Consultation Visits-CV) conducted by MoHCDGEC through RRHMP; gaps identified from RRH 5S-KAIZEN M&E reports conducted quarterly; as well as ISS and EHPA reports.

It is worth remembering, the approach of 5S-KAIZEN-TQM started to be implemented in Tanzania in 2007 at Mbeya Zonal Referral Hospital while the first Guideline was released in 2009. Since then, the approach has been rolled out to all zonal consultant and specialized hospitals, Regional and District hospitals (public and designated) and few lower health facilities under health BRN commodity management component. Remarkably, still health services provided in most of the health facilities in the country leave much to be desired in terms of quality.

Reports from 2017 and 2018 EHPA conducted to 28 Regional Referral Hospitals signaled most of the hospitals to have significant challenges and gaps in Area 10 (Infection Prevention Control-IPC, Safety Measures and Risk Management) specifically sub-section of IPC. This, highlights the work we still have, to continually improve quality of services being rendered by our hospitals be it RRH, District Hospital or any other health service facility in Tanzania.

MoHCDGEC through RRHMP- JICA have realized that to continually improve the quality of health services, there is a need for continued supportive supervision and on job trainings/orientation that should involve coaching, mentoring and sharing of knowledge and experiences among health facilities staff. This aspiration will be achieved with provision of carefully developed up to date guideline that addresses current challenges/gaps affecting provision of quality services in the facilities. This “Guideline for implementation of 5S-KAIZEN-TQM Approach in Tanzania, Fourth Edition” has taken on board the most currently revealed gaps in implementation of the 5S-KAIZEN approach; most of the areas and illustrations that were not well understood in other editions have been simplified and therefore, more user friendly.

As it has always been, 5S-KAIZEN-TQM Approach continued to be implemented as a foundation that makes all other quality improvement approaches at health services facility to work efficiently. Hence, the fourth edition is dedicated to ensuring health care providers in the country implementing 5S-KAIZEN-TQM quality improvement approach is up dated on current and emerging quality improvement and safety issues in their daily line of activities. The MoHCDGEC is therefore, strongly committed to ensure smooth implementation of this guideline through close follow up and frequent supportive supervision to health facilities. I therefore invite all facility in charges to effectively utilize this Fourth Edition Guideline and as reference document to implement 5S-KAIZEN-TQM activities for improving quality of services they provide.



Prof. Muhammad Bakari Kambi
Chief Medical Officer, MoHCDGEC

Acknowledgement

This is Fourth Edition of the Guideline for Implementation of 5S-KAIZEN-TQM Approaches in Tanzania released almost six years after the third edition. The process of developing the “Fourth Edition” has been the same as other editions involving 5S-KAIZEN-TQM National Facilitators, participants from different TOT trainings, Quality Improvement and 5S-KAIZEN-TQM Approach experts.

MoHCDGEC is very grateful and would wish to appreciate the efforts made by all who participated in one way or another at any level of development of this edition. Specifically, the ministry would like to extend sincere thanks to 5S-KAIZEN National Facilitators from Muhimbili National Hospital (MNH), Mbeya Zonal Referral Hospital (MZRH), Kilimanjaro Christian Medical Centre (KCMC) University College, Bugando Medical Centre (BMC) and from MoHCDGEC departments. It is for their tireless efforts that this edition has been made possible.

Furthermore, the ministry would like to express her jovial gratitude to the experts of 5S-KAIZEN-TQM Approach from RRHMP-JICA: Dr. Hisahiro Ishijima and Noriyuki Miyamoto for their materials, financial and technical inputs into this edition.

Lastly MoHCDGEC would like to deliver her sincere thanks to the Government of Japan through JICA for their immense supports targeting the health sector to improve delivery of quality services in the country. With release of this fourth Edition, indeed, QI through implementation of 5S-KAIZEN-TQM Approach at all levels of health care delivery, Quality is now painted priority number ONE.



Edward N. Mbanga

Director, Policy and Planning, MoHCDGEC

Chapter 1: Quality Improvement activities in Tanzania

1.1. Background

Provision of quality health care is one of the top priorities in the National Health Policy 1990; and revised in 2002; and updated in 2007 introduced in the Health Sector Strategic Plan (HSSP)-II 2003-2009; and HSSP-III 2009-2015. The strategy to improve the quality of healthcare has been followed by HSSP-IV 2015-2020, and activities to improve quality and safety have been activated in various areas in the health sector.

The overall objective of HSSP-IV 2015-2020 is to reach all households with essential health and social welfare services, meeting as much as possible, the expectations of the population, adhering to objective quality standards, and applying evidence-informed interventions through efficient channels of service delivery.

During implementation of HSSP-IV, several policies and guidelines have been reviewed, which includes Tanzania Quality Improvement Framework (TQIF) 2019-2024, National Quality Improvement Strategic Plan 2019 and Implementation Guidelines 5S-KAIZEN-TQM Approach in Tanzania “Way for Total Quality Managed Hospital” 2019.

1.2. Quality Improvement implementation structure in Tanzania

1.2.1. Current situation of Quality Improvement activities in Tanzania

MoHCDGEC supervise National, Specialized, Zonal, Referral in the implementation of Quality Improvement (QI) activities through Hospital Boards, Hospital Management Teams, Quality Improvement Team (QIT) and Work Improvement Teams (WITs) specifically established to ensure quality of services are maintained at the facility level.

On the other hand, RHMT has an advisory role to MoHCDGEC on the performance of RRHs, Council / District Hospitals, Health Centers and Dispensaries at the Regional and Councils / Districts levels. RHMT conducts monitoring and evaluation on the implementations of QI activities at the RRHs down to the Councils level / Districts Hospitals, Health Centers and Dispensaries through CHMTs. Each facility at these levels operate through QIT and WIT in improving quality of services.

1.2.2. Team formulation for Quality improvement in the health facility

Team approach is recommended in many academic and operational researches papers for successful implementation of QI programs. Based on the evidences from various studies, team approach was also adopted in TQIF, and it is guided health facilities to establish QIT under health facility management, and WIT under each department or section.

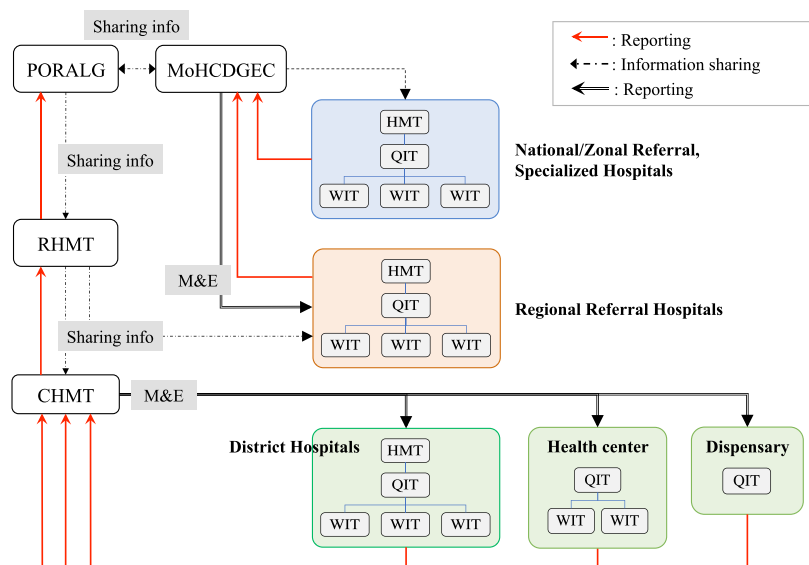


Table 1-1: Recommended QI implementation structure at all levels

1.3. Challenges in Quality Improvement in Tanzania

1.3.1. Central

- Inadequate inter-ministerial coordination and harmonization among departments
- Key QI documents are outdated:
 - Tanzania Quality Improvement Framework for Health (2011-2016)
 - National QI strategic plan (2013-2019)
- Existing quality initiatives are not “Client focused”; most of them are focusing on process and completion of work (Quality control QC and Quality assurance (QA))

1.3.2. Health Facility

- Inadequate supports from health facility management team:
 - Complaints and issues arising from patient’s and client’s dissatisfaction are not addressed
 - Incident reporting system (Medical error reporting system) is not established
 - Orientation and induction training for newly employed staff is not sufficiently conducted
 - Uncoordinated health care services are provided to clients i.e. conflicting prescriptions to patients

- Inappropriate work environment:
 - Team work at working areas is not strong enough
 - There are a lot of malfunctioning medical equipment
- Malfunctioning Quality initiatives:
 - Roles and responsibilities of QIT and WITs are not clear and not well disseminated to hospital staff
 - QIT is not clear in organogram of the hospital
 - Majority of managers and hospital staff is not aware of QI
 - Knowledge and skills on QI are limited among managers and hospital staff
 - Trained staff on QI including 5S-KAIZEN-TQM Approach in a hospital are not well utilized
 - Mechanism of information and knowledge sharing in QI is not established

1.4. Strategies for Quality Improvement

MoHCDGEC revised National Quality Improvement Strategic Plan in 2019. Areas focusing QI has been reemphasized. Safety and effectiveness of services, procedures and working environment will be strengthened. The health sector will continue to standardize clinical management and use of appropriate, safe and cost-effective medicines, and improve the availability of functional medical equipment and high standards of diagnostic services.

Despite achievements observed on those hospitals in improving quality of health service delivery on revenue collection, cost reduction, reduction of sepsis and reduction of time waiting for services. It was observed some weakness of functionality for QIT and WIT from health facilities in Tanzania. To overcome this situation, the following issues need to be taken care of:

- Take quality and safety improvement as the hospital policy and strategy seriously
- Deploy the policy of quality and safety improvement to all staff working in the hospital
- Recognition of weak functionality of QIT and WITs, and restructure the teams. Then, recognize them officially in the hospital organogram with proper terms of references.
- Allocate permanent staff and annual budget for different QI activities

1.4.1. Strengthening the teams for QI at health facility

Strengthening the teams for QI is one of the strategies for improvement of quality and safety at health facilities. Knowing and understanding roles and responsibilities of the teams for QI is important for performance of the teams. Therefore, each team member needs to understand what is supposed to be done and what and how other teams will perform. Roles and responsibilities of each team are as follows;

Table 1-1: Examples for Roles and responsibilities of teams on QI

Teams / Unites/Section	Roles and responsibilities
Hospital Management Team (HMT)	<ul style="list-style-type: none"> • Develop and deploy vision and mission of the health facility • Allocate budget for QI activities • Secure allocated budgets for QI activities • Allocate staff for QI activities • Follow the national QI strategy in the hospital • Communicate with QIT on QI activities and provide advices to QIT • Establish and facilitate “Two-way communication” to capture voices from frontline health workers
Quality Improvement Unit (QIU) or Quality Improvement Team (QIT)	<ul style="list-style-type: none"> • Develop annual QI activities and financial plan, and submit to health facility management team (HMT / HFGC) • Review the QI activity plan to continuously accommodate all identified gaps from any monitoring and evaluation activities • Coordinate oversee all QI activities • Select focal person(s) for specific QI programs • Conduct situation analysis before implementing any QI activities • Train hospital staff on QI activities • Emphasize use of KAIZEN in problem solving at the hospital • Conduct periodical monitoring and evaluation for QI activities, and provide technical advices to WITs for further improvement • Provide supports in development of monitoring and evaluation checklists and its application to WITs for further improvement • Responsible for record keeping and archives of all QI activities conducted in the hospital • Coordinate best practices from one service point and sharing its information to others for further improvement in the hospital • Demonstrate proper implementation of 5S-KAIZEN-TQM Approach through mentoring and coaching • Develop annual QI implementation report and submit to HMT • Participate in preparations of CHOP and QPR
Work Improvement Teams (Sectional level or department level)	<ul style="list-style-type: none"> • Develop orientation package to newly posted staff on QI activities • Implement all QI activities at the department or section level • Share and contribute ideas, effort and time to help improvement of the team’s effectiveness with the department or section level • Conducting monitoring & evaluation of day-to-day QI practice. • Document & share the results of M&E within other staff in the department or section • Work and address the gaps identified during the supportive supervisions and other assessments • Have regular communication with QIT

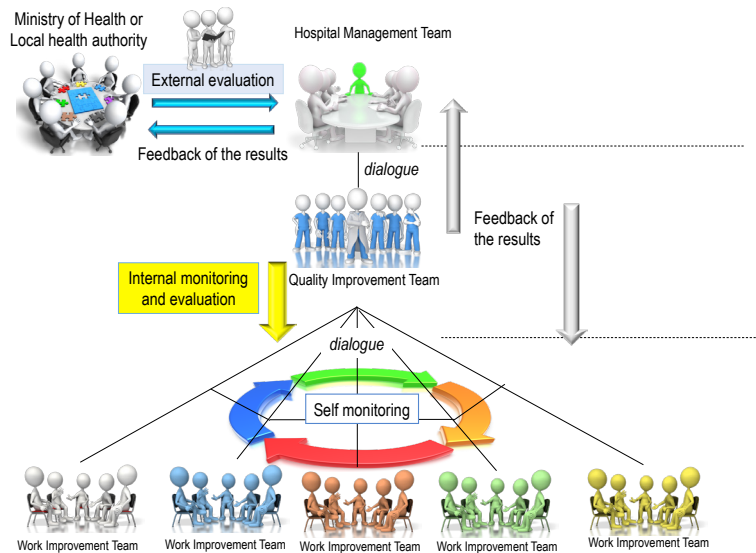


Figure 1-2: QI implementation structure

QIT

- Positive mindset and strong commitment on QI
- Staff who has influences on other hospital staff
- Staff has technical expertise on Quality Improvement
- Good communication, good documentation and good teaching skills

WIT

- Staff has technical expertise on Quality Improvement
- Staff who can show “Day to Day Leadership” within the department /section
- Positive mindset and strong commitment on QI
- Good record keeping, and good facilitation, skills

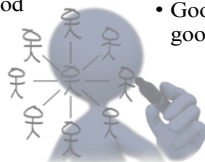


Figure 1-3: Example of selection criteria for QIT and WIT members

People often misunderstand the purpose of establishing QIT and WITs as they are thinking the QIT is only for 5S-KAIZEN-TQM activities. Note that QIT is established to coordinate and oversee all QI activities related to hospital infrastructure, commodities management, service delivery such as IPC, staff safety program, laboratory accreditation etc. that are implemented at the health facilities. WITs are established for implementation and management of QI activities for optimization of departmental or sectional functions. In case of introducing new QI programs, hospital management explains roles and responsibilities of existing QIT/QIU and WITs, and insist importance of utilizing existing teams for implementation of the new QI programs.

Based on the past experiences from the long-term implementation of QI activities in health facilities, “Sustainability of QI activities” is the biggest question raised by stakeholders. However, establishment of formal structure for QI activities seem more effective for “Sustainability of QI activities”. Therefore, it is strongly suggested to establish Quality Improvement Unit (QIU) rather than QIT. QIU should be a part of the facility organogram under the Hospital Management Team. This structure changes the management of QI activities through the allocation of full-time staff and regular budget allocation to focus on all QI activities in the health facility in sustainable manners.

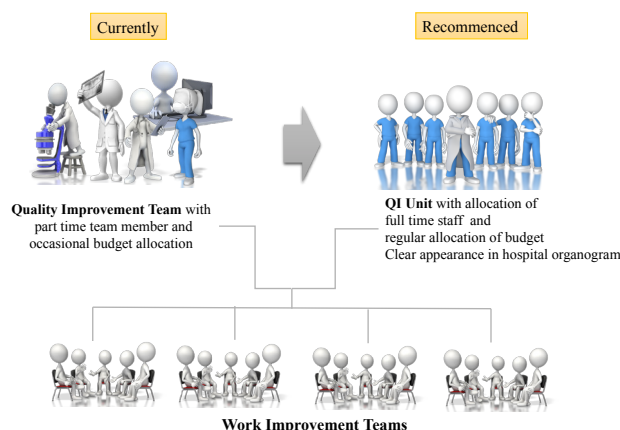


Figure 1- 3: Creating strong QI implementation structure in the facility

Table 1-2: Difference between QIT and QIU

	Quality Improvement Team (QIT)	Quality Improvement Unit (QIU)
Selection of members	Voluntary with multitask activities	Appointed with specific roles and responsibilities
Member allocation	Part time allocated personnel	Fulltime allocated personnel
Participation and involvement	Occasional participation or Irregular participation	Full participation and involvement on quality issues
Operation	Task oriented	Strategic oriented /planning
Status in the facility organization	Not necessary included to the hospital organogram	Included to the hospital organogram
Budget allocation	Partial or no budget for activities	Activities budgeted
Reporting to management	Not Answerable	Answerable
Intervention	Ad hoc implementation	Planned activities
Management of Quality	Selective implementation of Quality activities	Easy to oversee all Quality issues

Chapter 2: 5S-KAIZEN-TQM approach in Tanzania

2.1. History of 5S-KAIZEN-TQM approach in Tanzania

The 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 QI methods and implementation plans. Tanzania had participated in AAKCP and chosen Mbeya Zonal Referral Hospital (MZRH) as the pilot hospital of the 5S-KAIZEN approach. First step, 5S approach was introduced to various levels of health facilities which included National, Consultant Hospitals, Specialized Hospitals, RRHs, 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 the 5S approach, some hospitals showed good performance in the 5S practices, and reached a stage allowing to step up to KAIZEN approach. MZRH was the first hospital that applied KAIZEN approach for problem solving at the department level in the hospital. Based on the successful implementation of KAIZEN approach at MZRH, Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDEG) decided to scale up the KAIZEN approach to other hospitals, which had good performance in 5S approach. Related with the movement, revised “Implementation Guidelines for 5S-KAIZEN-TQM Approaches in Tanzania”, in 2011 (2nd edition) to enrich the KAIZEN concepts and approach. The guideline was revised again in 2013 (3rd edition) for betterment of the contents. MoHCDEG trained staff from other hospitals on KAIZEN approach since 2011, and as of June 2014, a total of 18 hospitals have been trained on KAIZEN approach. Currently, 158 KAIZEN cases are reported from 27 hospitals (1 National Hospitals, 3 Zonal Hospitals and 23 RRHs).

2.2. Lessons learned from past experiences

The following achievements and common issues have been seen in many hospitals that were participated in 5S-KAIZEN-TQM trainings in the past:

Achievements

1. Awareness on Quality and Safety among health managers and workers is increased
2. Concept of establishing QIU was introduced to 1 National Hospitals, 3 Zonal Hospitals and 23 RRHs
3. Client feedback mechanism is improved
4. Majority of QIT/QIU members at tertiary and secondary healthcare facility level obtained knowledge on 5S-KAIZEN activities
5. Majority of the hospitals are implementing 5S-KAIZEN activities to improve quality of healthcare services, work efficiency, safety, and cost-effectiveness etc.

6. Good and conducive working environment to majority of hospitals

Challenges

1. *Low performance of QIT and WITs:*

QIT and WITs were established to promote QI activities in health facilities, however, in some health facilities QIT and WITs are not active to carry out day-to-day activities. One of the major reasons behind is appointing the staff to engage QI activities as a part-time assignment beside their main job allocation.

2. *Inappropriate dissemination of knowledge and skills obtained from training of trainers:*

Unfortunately, peoples who participated in 5S and KAIZEN trainings do not share training feedback to the hospital management and other staff. Mobilization of the trained staff is not practiced properly in some health facilities.

3. *Insufficient knowledge on the concept of 5S activities:*

Some health workers misunderstand the actual purpose of 5S activities. It is thought that applying 5S tools such as labeling, zoning, color coding, etc. is the 5S activity.

4. *Inappropriate and irregularity of internal monitoring and evaluation of 5S-KAIZEN activities:*

Necessity of internal monitoring and evaluation of 5S-KAIZEN activities is not well understood by hospital management and QIT/QIU members; which leads to stagnation of 5S-KAIZEN activities.

5. *No succession plan developed and implemented:*

Some hospitals have weak QIT and WIT function. Majority of hospitals does not have succession plan of QIT and WIT members, and rely on the individual health workers, who are trained on QI including 5S-KAIZEN-TQM approach.

2.2.1. Domains for successful national rollout of 5S-KAIZEN-TQM

Domains for successful national rollout of 5S-KAIZEN-TQM is defined as very strong factor which must be considered for any success to be achieved. Based on the past experiences, the following six domains were identified as the successful rollout of the 5S-KAIZEN-TQM approach in the health sector.

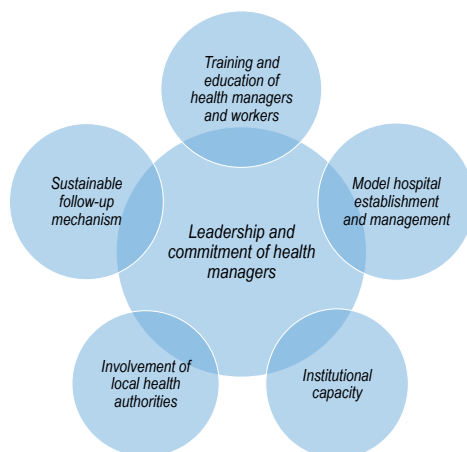


Figure 2-1: Six domains for successful national roll-out of 5S-KAIZEN-TQM

Table 2-1: Description of six domains for successful national roll-out of 5S-KAIZEN-TQM

Domain		Brief explanation
1	Leadership and Commitment	Many researches on KAIZEN have identified leadership and commitment of top management of health facilities as a positive factor for the success of 5S KAIZEN activities. Tanzania case study identified that flagship of MoHCDGEC on introduction of 5S-KAIZEN-TQM approach into public hospitals was one of the key elements for successful national rollout of the approach. Moreover, the hospitals that declared the official implementation of the 5S-KAIZEN-TQM approach by the top management are showing better function of QI implementation structure than the hospitals without the declaration. Thus, it is necessary to identify some activities in this domain for successful dissemination of the 5S-KAIZEN-TQM approach.
2	Training of Hospital managers and staff on 5S-KAIZEN-TQM approach	To disseminate the 5S-KAIZEN-TQM approach nationwide, it is necessary to conduct series of training on 5S-KAIZEN-TQM approach for hospital managers and all staff. Thus, it is necessary to identify some activities such as development of training materials, manuals etc. for successful dissemination of the 5S-KAIZEN-TQM approach.

	Domain	Brief explanation
3	Sustainable follow-up mechanism including M&E activities	<p>To disseminate the 5S-KAIZEN-TQM approach nationwide, it is necessary to have effective and efficient follow-up mechanism to support health facilities that implement 5S-KAIZEN-TQM approach.</p> <p>Tanzania case study revealed that hospitals that conducting regular internal supportive supervision were performing 5S-KAIZEN-TQM activities better than the hospitals which are not conducting internal monitoring activities. Thus, it is necessary to identify some activities in this domain for successful dissemination of the 5S-KAIZEN-TQM approach.</p> <p>Egyptian case study revealed that hospitals that receive periodical visit from quality department were performing 5S-KAIZEN-TQM activities better than the hospitals that did not get any support during the pre-pilot program.</p>
4	Model of hospital establishment and management through 5S-KAIZEN-TQM approach	<p>Based on the experiences from Tanzania, Sri Lanka, and DRC, the countries that succeeded the establishment of a model hospital of the 5S-KAIZEN-TQM approach are conducting effective training and practice on 5S-KAIZEN-TQM approach. The model hospitals attracted other facilities within the country and other countries to learn from their experience and some make study tour. Receiving the visitors and showing the 5S-KAIZEN activities is motivating health managers and workers to practice better and better, which leads the further improvement of QI activities in the hospital. Thus, it is necessary to identify some activities in this domain for successful dissemination of the 5S-KAIZEN-TQM approach.</p>
5	Institutional capacity	<p>Introduction, practice and sustainability of QI activities need to have good institutional/ organizational capacities.</p> <ul style="list-style-type: none"> • Functional QI team to coordinate and oversee the QI activities need to be established • The team need to be equipped with good knowledge and skills to carry out their tasks • The team has to have good succession plan to sustain their function <p>Thus, it is necessary to identify some activities in this domain for successful dissemination of the 5S-KAIZEN-TQM approach for example development of action plan, M&E of QI activities.</p>

Domain		Brief explanation
6	Involvement of Local Government Authorities in Monitoring and Evaluation	Based on Tanzanian case study, functions of M&E of 5S-KAIZEN-TQM approach was from central level at the early stage of National dissemination of the 5S-KAIZEN-TQM approach. However, as the number of health facilities practicing 5S KAIZEN increases, centralized M&E system will not function effectively due to the insufficient resources allocation to conduct these activities. Therefore, it is recommended to involve RHMTs and CHMTs to carry out the follow-up activities within their jurisdiction area. Thus, it is necessary to identify some activities in this domain for successful dissemination of the 5S-KAIZEN-TQM approach.

2.2.2. National Facilitators of 5S-KAIZEN-TQM Approach

National Facilitators are group of health care workers from the ministry, National Hospital, Zonal and few RRHs; who were trained as national facilitators and involved in Monitoring and Evaluation at the national level. They are competent in QI activities and 5S-KAIZEN-TQM approaches.

2.2.3. Roles and responsibility of the national facilitators

National facilitators of 5S-KAIZEN-TQM Approach were trained to disseminate the 5S-KAIZEN-TQM approach to health facilities at different level of health systems in Tanzania. They are assigned to develop or revise guidelines, several training materials, M&E tools, and use them to train RHMTs, CHMTs, health managers and health care workers for better implementation of the 5S-KAIZEN-TQM approach for improving quality healthcare services. They are also assigned to provide technical back up through series of the follow-up activities. Table 2-2 summarized the roles and responsibilities of the national facilitators at different level of the health systems.

Table 2-2: Roles and responsibilities of national facilitators at different levels of health facilities

Implementation levels	Roles and responsibilities	Target facilities
National level	<p>At national level, the national facilitators have very important roles of disseminating the approach to national hospital, zonal referral hospitals and specialized hospitals. Monitor and evaluate 5S-KAIZEN-TQM activities and provide technical inputs for further improvement is also their roles. Their responsibilities at national level are as follows;</p> <ul style="list-style-type: none"> ● Translate national strategies and guidelines on QI to Hospital Management Teams at tertiary hospitals ● Develop effective training materials for 5S-KAIZEN ToT ● Facilitate training on implementation of 5S-KAIZEN for HMTs and QIT/QIU of tertiary hospitals ● Conduct Consultation visit to tertiary hospitals ● Provide technical inputs during facilitator’s training to educate juniors on 5S-KAIZEN-TQM approach 	<p>National Hospitals</p> <p>Zonal Referral Hospitals</p> <p>Specialized Hospitals</p>
Regional level	<p>At regional level, the national facilitators have very important roles of disseminating the approach to RHMTs and RRHMTs through education and training and support establishment of functional implementation structure: Their responsibilities at regional level are as follows;</p> <ul style="list-style-type: none"> ● Translate national strategies and guidelines on QI to RHMTs and RRHMTs ● Facilitate training on implementation of 5S-KAIZEN for RHMTs and RRHMTs ● Facilitate training on M&E of 5S-KAIZEN ● Provide technical inputs for reflection of 5S-KAIZEN activities in CHOP and reported in Quarterly Progress Report 	<p>Regional Referral Hospitals</p> <p>Referral Hospitals at regional level</p>
District level	<p>At district level, the national facilitators have very important roles of disseminating the approach to CHMTs and HMTs through education and training and support establishment of functional implementation structures till the peripheral health facilities. Their responsibilities at district level are as follows;</p> <ul style="list-style-type: none"> ● Translate national strategies and guidelines on QI to CHMTs and HMTs ● Facilitate training on implementation of 5S-KAIZEN for CHMTs and HMTs ● Provide technical support when CHMTs are disseminating 5S-KAIZEN-TQM approach to Health Center and Dispensaries ● Facilitate training to CHMTs on M&E of 5S-KAIZEN activities ● Provide technical inputs for reflection of 5S-KAIZEN activities in CCHP and reported Quarterly Progress Report 	<p>District Hospitals</p> <p>Designated District Hospitals</p> <p>Health centers</p> <p>Dispensaries</p>

2.2.4. Health facilities implementing 5S-KAIZEN activities

MoHCDGEC has been disseminating 5S-KAIZEN-TQM approach to all levels of health facilities since 2007. Large number of districts health facilities were targeted to introduce 5S-KAIZEN-TQM approach for improvement of health commodities management under Big Result Now Initiative in twelve regions since 2016. Number of health facilities, introduced KAIZEN approach are also gradually increasing. The approach is also introduced in Regional Health Management Teams (RHMTs) and Council Health Management Teams (CHMTs) to strengthen the follow up and M&E activities for the 5S-KAIZEN-TQM approach.

Table 2-3: Number of health facilities introduced 5S-KAIZEN-TQM approach

Levels of health facilities	Number of facilities that 5S approach is introduced	Number of facilities that KAIZEN approach is introduced
National Hospital	1	1
Specialized Hospital	4	0
Zonal Referral Hospital	3	3
Regional Referral Hospital	28	28
Referral Hospital at regional level (Private not for profit)	10	0
District Hospital	113 (13 received full 5S training and 100 received 5S training on commodity management)	0
Council/District Designated Hospital	14	4
Health Center	197 (only 5S on commodity management)	0
Dispensary	1435 (only 5S on commodity management)	0
Total	1,805	36

Chapter 3: Quality and Safety in Healthcare settings

As mentioned in the previous chapter, the health sector in Tanzania has been facing a lot of operational problems which include mistakes during patient care, un-coordinated procedures during patient care etc. These results to dissatisfaction of both internal and external clients, and some occasions caused serious incidents in the health facilities. This chapter aims to increase awareness on Quality and Safety among health workers.

3.1. Quality and safety in healthcare

Improving the quality and safety of health services represents a major challenge in low- and middle-income countries where the exact magnitude of unsafe healthcare practices remains unclear. Wilson has reported that the rates of preventable harm and death are increasing, causing alarm amongst policy makers and healthcare providers. In response, many quality improvement initiatives have appeared in the health sectors of low- and middle-income countries in order to train healthcare providers in various QI approaches. Despite such efforts, quality and safety in healthcare remains a major challenge.

The U.S.s Institute of Medicine¹ issued a shocking report in 1999. It was reported that errors cause between 44,000 and 98,000 deaths every year in American hospitals, with over one million injuries. The biggest killers include:

- Hospital-associated infections
- Medication errors
- Patient accidents
- Communication problems
- Disorganized work environment

As shown above, in developed countries, as many as 1 in 10 patients is harmed while they receive hospital care. In developing countries, the risk of healthcare-associated infection in some developing countries is as much as 20 times higher than that in developed countries.

The hospital industry is hazardous and many employees work in different job categories. These employees are involved in risky procedures to save patients, with many conflicts. Other hazardous industries tend to have fewer employees of fewer categories involved in risky procedures to make a product or provide a service, usually with less conflict.

Hospitals appear to be far behind other high-risk industries in ensuring basic safety. Hospitals should be Highly Reliable Organisations (HROs), considering they handle human life with risky procedures. In HROs, errors can have catastrophic consequences, but they consistently avoid such errors. To accomplish this, they conduct relatively error-free operations over a long time period and make constantly good decisions, resulting in high quality and reliability. Examples of such organisations include aviation and airlines, air traffic control and nuclear power plants. Could hospitals become the same type of organisation? The answer is YES, and it can be achieved through the proper organisation of the work environment in hospitals.

¹ The Institute of Medicine (IOM) released a report in 1999 entitled 'To error is HUMAN: BUILDING A SAFE HEALTH SYSTEM'

3.2. “Problem” in health care settings

5S-KAIZEN-TQM Approach has been successful for improving healthcare not only in Tanzania but other developing and developed countries. This step-wise approach starts from identification of problems and solving those problems on evidence-based to improve and sustain quality services. Therefore, understanding about problem is very important step in tackling quality issues.

3.2.1. What is Problem?

Since KAIZEN approach is defined as a *problem-solving process* in the Implementation Guideline for 5S-KAIZEN-TQM Approaches in Tanzania, it is better to know what a *problem* is and how we can handle it smartly. Then, we can change our attitudes and take the necessary action(s).

A *problem* is defined as a gap between an ideal situation and the current situation. What is the ideal situation of your organisation? Is it known and clear to everyone in your organisation? Staff members must discuss and agree upon the ideal situation of your organisation. In our setting, the ideal situation is defined as achieving recommended standards. Therefore, the standards should meet the needs and expectations of clients and visitors. It is important to know that clients’ needs and expectations do change, so staff must have skills and knowledge on how to identify clients’ needs and expectations. This helps identify the problem facing the health facility.

$$\text{Ideal situation} - \text{Current situation} = \text{“Problem”}$$



Figure 3-1: Illustration on “Definition of Problem”

3.2.2. Level of Problem

The definition of *problem* has been clarified. However, we need to understand few more things about problems. Importantly, a problem is comprised of various factors, meaning a problem is not caused by one factor. Usually, bigger problems are complicated and affected by many factors.

Conversely, a small problem is easier to solve, has few composing factors, and is simpler to manage. For example, regarding the problem of wrong medications given to in-patients, we should note that there are different types of medicines and, hence, need to know which medication was wrongly given to in-patients. We cannot conclude that all types of medicines are wrongly given as medication. The medicines could be injectable, oral, ointment or inhalers, meaning the problem involves giving the wrong injectable medicine, giving the wrong ointment, giving the wrong inhaler medicine and so on. Thus, we must classify medication and the factors affecting each.

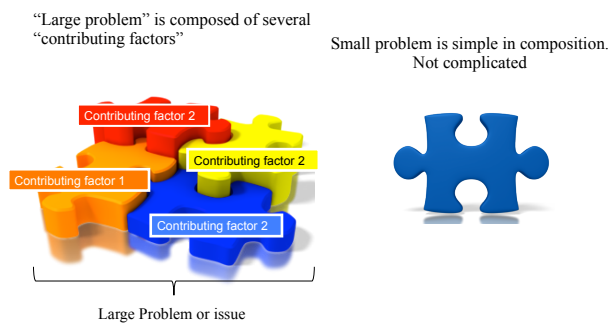


Figure 3-2: Component of contributing factors of a problem

Notably, three levels of problems exist in an organisation: 1) large, 2) medium and 3) small. Generally, the levels of problems occur in an organisation at approximately a 1:3:6 ratio.

Many people spend more time discussing and expending energy and resources to solve large problems because they draw more attention and are challenging. However, these problems exist only 10% of the time (see Figure 3 below). Starting by attempting to solve large problems may lead to failure. Large problems are complicated and need more time and resources. Indeed, innovation may be necessary to change any systems involved. Therefore, it is recommended to start solving small problems rather than large ones. Because small problems are simple and easy to solve, solving them and feeling successful will increase motivation and confidence among staff.

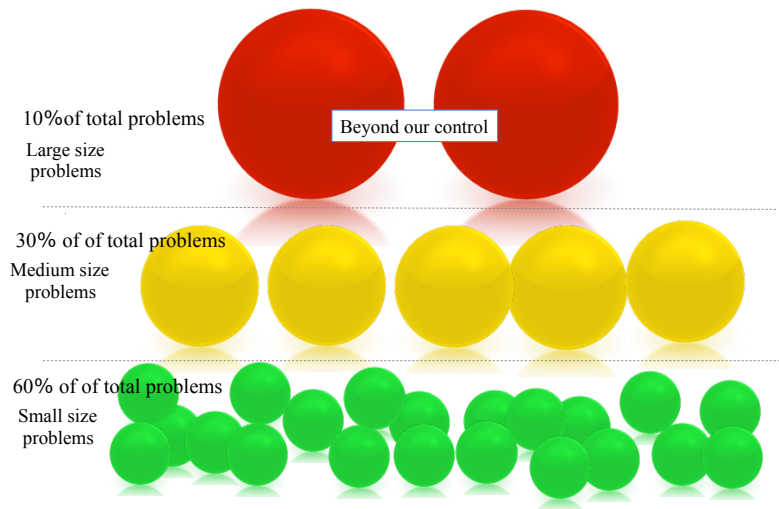


Figure 3-3: Three levels of problems / issues

3.3. Basic concepts of Quality

3.3.1. Definition of quality

Quality can be defined in different ways²³⁴. The following definitions are commonly used in the manufacturing sector:

- *Quality* is performance according to standards/specifications⁵⁶
- *Quality* is meeting or exceeding customer expectations
- *Quality* is doing right things, the right way the first time

Dr. E. Deming, an American engineer, statistician and management specialist, stated, “*Good quality does not necessarily mean high quality. It means a predictable degree of uniformity and dependability at low cost with a quality suited to the market*”. However, the U.S. Institute of Medicine, National Academy of Science, defined “*quality in the health sector as the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge*”.

2 <https://itemscatalogue.redcross.int/quality-standards-inspection.aspx>

3 <https://www.shsu.edu/~mgt ves/mgt481/lesson1/lesson1.htm>

4 <https://www.qualitydigest.com/july97/html/q4one.html>

5 <https://www.gbnews.ch/what-is-your-definition-of-quality/>

6 <https://www.gbnews.ch/what-is-your-definition-of-quality/>

3.3.2. Differences among QC, QA, QI and QM

Many people misunderstand or confuse the quality terms often used in the health sector. Therefore, it is important to define those terms clearly and adopt the correct quality terms. The definitions of major quality terms are as follows:

- **QC** is a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria.
- **QA** is defined as a procedure or set of procedures intended to ensure that a product or service under development meets specified requirements.
- **QI** is a systematic effort to improve the quality of a health and social welfare system.
- **QM** improves the quality of products or services by reflecting customers' needs and demands.

As a hospital management team, it is strongly recommended the QM concept be adopted to improve the quality and safety of health services.

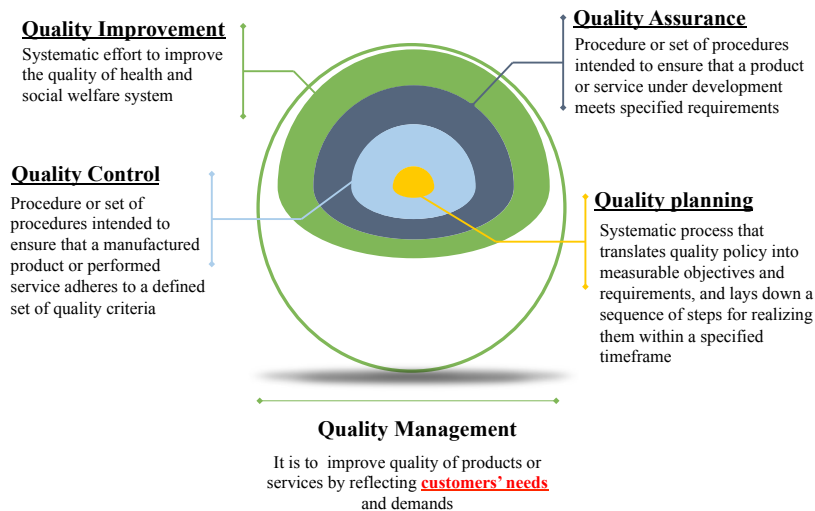


Figure 3-4: Quality Management concept

3.3.3. Dimension of quality

“Quality” is defined in simply means “performance according to standards” or “doing right thing, the right way at the right time” in manufacturing sector. In health care, quality is considered as a degree of performance in relation to a defined standard of interventions known to be safe and have the capacity to improve health within available resources⁷. Institute of Medicine (US) defined quality of healthcare as “*The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge*”⁸.

Dimension of quality is also important to understand. Dimension of quality is the factors that influence the level of quality. It suggests that a health system should seek to make improvements in six areas or dimensions of quality, which are named and described below. These dimensions require that health care be⁹:

Table: 3-1: Dimension of Quality ¹⁰

Key dimensions of quality	Brief explanation
<i>Effectiveness</i>	Delivering healthcare that is adherent to an evidence base and results in improved health outcomes for individuals and communities, based on need
<i>Efficiency</i>	Delivering healthcare in a manner which maximises resource use and avoids waste
<i>Accessibility</i>	Delivering healthcare that is timely, geographically reasonable and provided in a setting where skills and resources are appropriate to medical need
<i>Acceptability/ Patient-Centeredness</i>	Delivering healthcare which considers the preferences and aspirations of individual service users and the cultures of their communities
<i>Equitability</i>	Delivering healthcare which does not vary in quality because of personal characteristics such as gender, race, ethnicity, geographical location or socioeconomic status
<i>Safety</i>	Delivering healthcare which minimizes risks and harm to service users

3.3.4. Domain of successful quality intervention

WHO (World Health Organization) has identified six domains of QI initiatives that assist the quality intervention process. They are intended to help policy makers address quality issues at a more strategic level. These generic domains are not hypothetical. They draw heavily on strategies for quality improvement applied in many health systems over many decades¹¹.

7 Tanzania Quality Improvement Framework in healthcare 2011-2016, MoHCDGEC, Tanzania

8 IOM Definition of Quality (1990), <http://iom.nationalacademies.org/Global/News%20Announcements/Crossing-the-Quality-Chasm-The-IOM-Health-Care-Quality-Initiative.aspx>

9 National Health and Social Welfare Quality Improvement Strategic Plan 2013-2018, MoHCDGEC Tanzania

10 Quality of Care, A process for making strategic choices in health systems, WHO (2006)

11 World Health Organization http://www.who.int/management/quality/assurance/QualityCare_B.Def.pdf



Figure 3-5: Six domains for successful QI

(1) Leadership

The issues involved that underpin the development of coherent strategies for quality improvement. Leadership is fundamental because there is clear evidence that quality initiatives fail to realize their desired outcomes if there is not strong, consistent leadership support – at every level – for the action taken. Without strong, sustained leadership across the health system, new strategic interventions are, thus, unlikely to succeed.

(2) Information

Information is fundamental, because any quality improvement depends on the capacity to measure change in processes and outcomes and on stakeholders having access to the information that changes what they do.

(3) Patient and population engagement

This domain is critical to quality improvement because individuals and communities play so many roles within health systems. Directly or indirectly, they will be financing care, working in partnership with health workers to manage their care and sometimes be the final arbiter of what is acceptable across all the dimensions of quality.

(4) Regulation and standard

Are frequently visited in the quest for quality improvement in health systems and offer considerable scope for policy interventions at the country level. Inspection and accreditation at varying levels can be provided that are appropriate to the resources available in the country. Setting standards and monitoring adherence to them may be one of the more efficient means of facilitating greater compliance with evidence.

(5) Organizational capacity

The issues for quality in this domain apply throughout the health system. At the national level, there should be the capacity to lead the development of policy, drive its implementation and keep performance under review.

(6) Model of care

The final domain reflects currently understood best practices for the delivery of healthcare generically and to population groups, such as groups defined by a common need (e.g. people with chronic conditions) or common characteristics (e.g. children or the elderly).

3.4. “Seven wastes” in relation to Quality Improvement

The word *waste* is often misunderstood in the health sector as medical wastes or other health material wastes. It is necessary to know that many wastes are hidden in work processes. The former Vice President of TOYOTA, Mr. Taiichi Ohno, advocated that wastes are hidden in seven areas in any type of business that do not produce added value.



Figure 3-6: Seven waste around our working environment

Table 3-2: Seven wastes

Seven wastes		Examples
1	Overproduction	Keep patients unnecessarily for observation, very high-speed laboratory equipment with fewer specimens.
2	Inventory	Overstocking and redundancy of medicines, medical supply in section or storage.
3	Transportation	Unnecessary movement for delivering medicine from central storage.
4	Motion	Looking for something or someone (files, equipment, tools, and staff) and moving around.
5	Rework	Medical/surgical errors, poor treatment result etc.
6	Over processing	Clarification of job order, misallocation of resources etc.
7	Waiting	People waiting for items, tools to provide services etc.

The wastes above are called “MUDA” in Japanese. Two more things should be eliminated by 5S-KAIZEN-TQM activities to improve hospital management and the quality of healthcare. Those are “MURA” (waste of unevenness) and “MURI” (Waste of overburdening). Note that “MURI”, “MURA” and “MUDA” are usually observed together. When a work process is imbalanced (“MUDA”), it causes too much of a burden on equipment and staff (“MURA”), which will cause all kinds of activities that do not add value.

Table 3-3: Explanation of “MURI”, “MURA”, and “MUDA”¹²

English	Japanese	Explanation
Overburdening	MURI	This term means too heavy a mental or physical burden. Any activity exacting unreasonable stress or effort from personnel, material or equipment.
Unevenness or Inconsistency	MURA	Any variation leading to unbalanced situations. MURA exists when the workflow is out of balance and the workload is inconsistent and not compliant with the standard.
Waste/wastage	MUDA	Seven wastes mentioned above. Any activity or movement in work processes that does not add value. It also does not create value for the customer.

¹² <http://www.makigami.info/forum/index.php?topic=2.0>

Chapter 4: Safety Improvement

4.1. Definition of patient safety

WHO defines *patient safety* as the prevention of errors and adverse effects to patients associated with healthcare. While healthcare has become more effective, it has also become more complex, with greater use of new technologies, medicines and treatments. Health services treat older and sicker patients who often present with significant co-morbidities requiring increasingly difficult decisions regarding healthcare priorities. Increasing economic pressure on health systems often leads to overloaded healthcare environments.¹³

4.1.1. Recommendation to improve patients' safety

There are many approaches that are recommended to improve patients' safety. The report *Free from Harm—Accelerating Patient Safety Improvement Fifteen Years After To Err is Human* reflects on progress toward improving patient safety and a lessening intensity of focus, since the publication of the Institute of Medicine's landmark report *To Err is Human*. The crux of the report is that what is needed is a total systems approach and a culture of safety. To that end, eight recommendations are given¹⁴:

- (1) Ensure that leaders establish and sustain a safety culture
- (2) Create centralised and coordinated oversight of patient safety
- (3) Create a common set of safety metrics that reflect meaningful outcomes
- (4) Increase funding for research in patient safety and implementation science
- (5) Address safety across the entire care continuum
- (6) Support the healthcare workforce
- (7) Partner with patients and families for the safest care
- (8) Ensure that technology is safe and optimised to improve patient safety

4.2. Definition of staff safety

A hospital is one of the most hazardous places to work. Therefore, it is important to seriously consider staff safety in a health facility. *Staff safety* can be defined as protecting staff against occupational hazards and exposure to pathogens in the hospital setting. Note that staff safety is often focused on only health professionals working in the health facility. However, staff in diagnostic and support services are also considered under the staff safety intervention.

4.2.1. Recommendation to improve staff safety

WHO reported that, among the 35 million health workers worldwide, about 3 million receive percutaneous exposures to bloodborne pathogens each year: two million of those to HBV, 0.9 million to HCV and 170,000 to HIV. These injuries may result in 15,000 HCV; 70,000 HBV; and 500 HIV infections. More than 90% of these infections occur in developing countries. To protect health workers from infections, WHO recommends the following:

¹³ Patient safety (WHO) <http://www.euro.who.int/en/health-topics/Health-systems/patient-safety>

¹⁴ <http://www.hhnmag.com/articles/6799-eight-recommendations-to-dramatically-improve-patient-safety>

- The implementation of universal precautions (ensuring personal protective gear, hand washing etc.)
- Immunisation against hepatitis B virus
- Provision of personal protective equipment and the management of exposure
- Development and implementation of safety strategies
- Establishment of an effective infection control committee with support from the health facility management team
- Enforce safe practices through monitoring and supervision

There are many ways to improve the safety of healthcare workers. Hospital managers need to consider improving staff safety together with patients' safety.

4.3. Hazard Prediction Training (HPT)

Sensing potential hazards is to improve patients' and health providers' safety. One of the methodologies to improve staff sensitivity is Hazard Prediction Training.

Hazard Prediction Training is a good tool for enabling health workers to perceive possible dangers at the work place, and take actions to prevent such a danger from occurring.

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

4.3.1. Objectives of HPT

The objectives of HPT are to enhance the following points among workers:

- To enhance his/her sensitivity to hazards and risks
- To improve occupational health and safety
- To cultivate leadership skills
- To improve problem-solving skills among employees
- To promote teamwork with the health facility

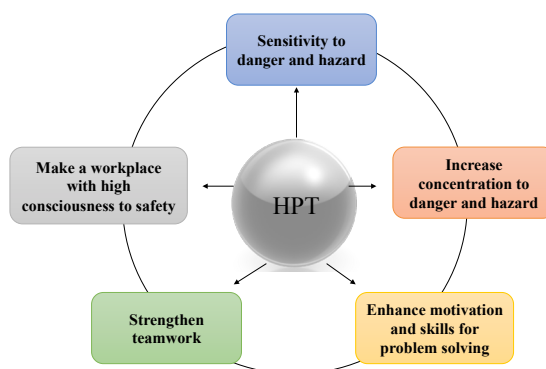


Diagram 4-1: How HPT works

4.3.2. HPT Principles

HPT principles are as follows:

- ZERO accidents and hazards
 - Eliminate accidents and hazards in daily life
 - Ensure safety and health of internal and external clients
- Anticipation
 - Learn from small near-accidents (Accidents did not actually occur but could have), and act on them before fatal accidents occur. There are hundreds of near-accidents that occur and leave no injuries, while one accident can happen and cause fatalities
- Everyone participates
 - Leadership is the key for safety management (top-down)
 - Voluntary efforts of employees in the field (bottom-up) are very important

4.3.3. What HPT can do for health sector?

- Enhance sensitivity to potential hazards before they occur with internal and external clients
- Improve safety in healthcare services
- Improve occupational health and safety
- Improve problem-solving skills of all cadres of hospital employees, including students
- Get into the habit of acting immediately to prevent hazards
- Promote and strengthen teamwork

4.3.4. How to conduct HPT

HPT implementation often involves the Four-round Methodology, briefly explained below:

- First Round: Identify potential hazards in the situation from pictures or illustrations prepared by organisers.
- Second Round: Identify vital hazards, narrow them down and select the vital hazards.
- Third Round: Develop preventive measures and discuss possible countermeasures to prevent the identified hazards.
- Fourth Round: Select the most important measures as a target and identify it with the team.

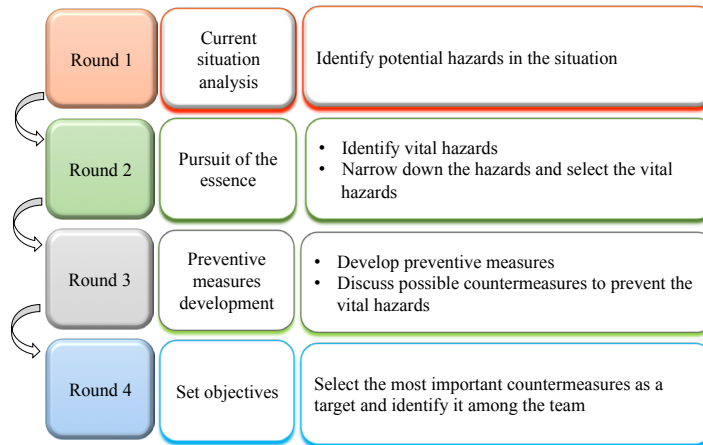


Diagram 4-2: How to conduct HPT

Note that preventive measures should not be confused with countermeasures. A *countermeasure is action taken because of something that has happened*. However, a preventive measure is action taken to prevent something that might happen or removing risk factors and the possibility of danger.

4.3.5. Tips for successful implantation of HPT

Generally, the following points are thought of the tips for the successful implementation of HPT:

- Appropriate number in one group: five to six members, in addition to the leader.
- Select a leader and a recorder before starting.
- Prepare photos/illustrations, HPT sheets, and black and red pens.
- Continuous HPT reduces human errors.
- Do not spend much time to discuss about the risks or hazard. (maximum of 15 minutes).
- This is a good exercise for medical and non-medical employees.
- Use your imagination and experiences.

First Round: Identify potential hazards in the situation

Look at the pictures or illustrations¹⁵ and list the following as much as possible:

- Risk factors (condition or behaviour which may cause accidents)
- Accidents they may cause
- Describe them in terms of cause and effect: example of the sentence for description
“Since(risk factors).....,(accidents)..... happen”
- Be specific and concrete

¹⁵ Please note that the HPT organizer needs to collect the pictures for HPT from daily work in the hospital. One might find many risky practices in one’s health facility. If it is difficult to collect pictures, illustrations can be utilized.

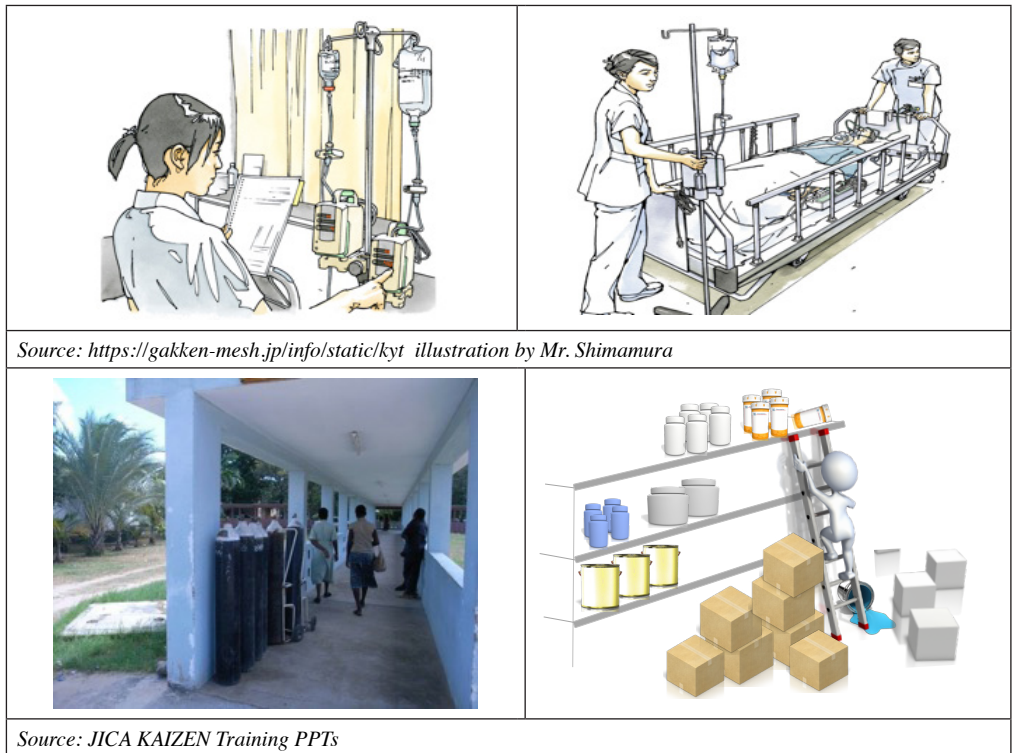


Figure 4-3: Examples of pictures and illustrations for round 1 of HPT

HPT Sheet		
		Date: / /
Members:		
No.	Risk factors	Accidents/incidents
1		
2		
3		
4		
5		
6		
7		
Significant dangers	Preventive Measures	

Figure 4-4: Example of HPT sheet

Second Round: Identify the vital hazards

- Mark significant hazards with □ according to their probability and seriousness.
- Mark the most significant hazards with □ by common consent.
- Consider the background (Why was the situation like that? Why did he/she behave so?)

Third Round: Develop preventive measures

- Discuss possible countermeasures to prevent the accidents identified in round 2.
- Preventive measures should be *specific and feasible*.
- Describe them using *positive* words and phrases, not negative ones.

Fourth Round: Set the target

- Select the most important and feasible measures according to common consent.
- The selected measure is the team's target to prevent accidents/incidents.
- *Point a finger* at the selected measures and repeat them loudly.
- ***Why point a finger at selected measures and repeat them loudly?***
- The method of pointing and calling enhances wakefulness. The pointing action is composed of 'shoot and look', which means acting with care. The calling action strengthens memory, and it is easy to take account of errors. Therefore, this action will increase the efficiency and safety of our services. The risks of making mistakes can be reduced by almost 85% compared with doing nothing¹⁶.

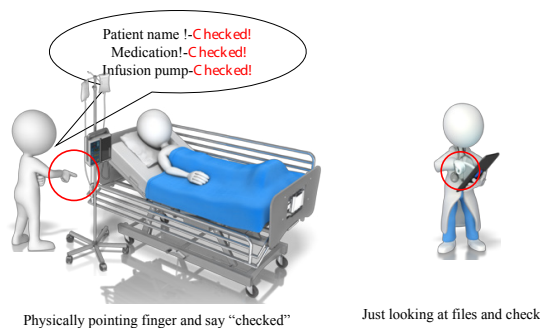


Figure 4-5: Pointing and calling

16 Finger-pointing to reduce accidents: <https://pulse.embs.org/may-2016/finger-pointing-reduce-accidents/>

HPT Sheet

Date: 13/ 6 /2019

Leader: John (MD)

Members: Mpinde, Kombo, Jovani

No.	Risk factors	Accidents/incidents
1	Since the ladder is standing on the spilled water and it is sliding,	a staff loses his balance and gets injuries by falling off the ladder
2	Since many bottles are store on the shelf,	the bottles falls down and hits him on the head.
3	Since box are piled next to the ladder a and the box is about falling down to hit ladder	a staff loses his balance and gets injuries by falling off the ladder
4	Since he climbs down the ladder without looking behind,	he stumbles on the bucket and falls
Significant hazards	Preventive Measures	
1	! Arrange all the items properly and make a space for safety work ! Keep the boxes in order ! Set the highest level of piling boxes and arrange the boxes under the level	

Figure 4-6: Example of how to fill in HPT sheet

Walk around your health facility with a digital camera, and try to find dangerous situations. Take photos to develop HPT training materials. You will find many unsafe practices, but take a photo before giving advice for improvement.

Chapter 5: Basic concept of the 5S-KAIZEN-TQM approach

In the past, the teaching of the 5S-KAIZEN-TQM approach started with the 5S approach and moved to the KAIZEN approach. Total Quality Management was not well explained, as it was considered an ideal situation resulting from KAIZEN activities. However, this teaching methodology led health managers in the wrong direction and affected the sustainability of 5S-KAIZEN-TQM activities. Therefore, we have reviewed the teaching methodology. First, we clarify the TQM concept at the time of teaching the 5S-KAIZEN-TQM approach. Subsequently, 5S and KAIZEN are taught in phases.

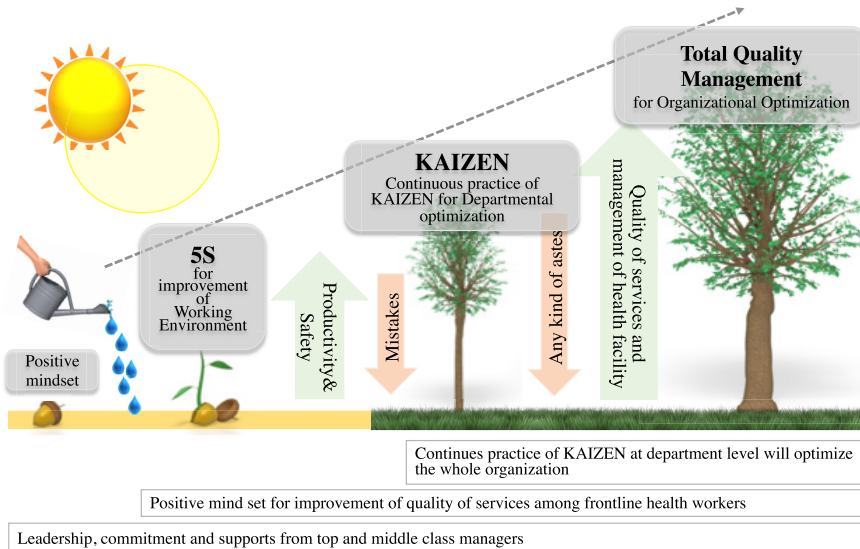


Figure 5-1: Stepwise Quality Improvement: 5S-KAIZEN-TQM approach

5.1. Concept of Total Quality Managed (TQM) Hospital

Total Quality Management (TQM) is a multi-disciplinary, participatory process with continuity across all categories of staff for realizing high-quality service and organisational optimisation. TQM process should be a part of the institutional managerial framework for seeking:

- High productivity,
- Cost effectiveness,
- The quality and safety of services,
- Morale,
- Moral and
- Good service delivery that creates value for patients.

In general, TQM is described as *organisational optimisation*. The optimisation of an entire organisation is not an easy task. To do so, the top management of the hospital needs to develop policy and strategy to operate and manage the hospital. Then, that policy and strategy need to be deployed well to the health managers and health workers, as shown in

figures 4-2 and 4-3. Middle managers and frontline health workers need to think about what they can contribute to achieve the hospitals policy and strategy through the management of day-to-day work.

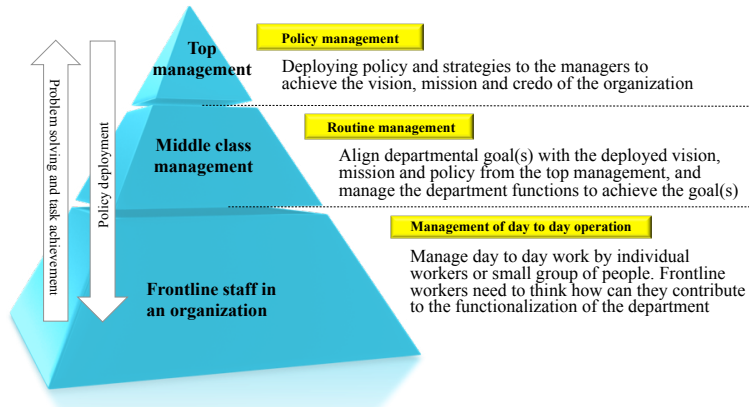


Figure 5-2: TQM concept

In the actual setting, TQM activities are conducted with the hospital management cycle based on the Plan-Do-Check-Act (PDCA) cycle. The alignment of a hospitals policy and management cycle is very important to achieve the hospitals vision and mission as depicted in the figure below.

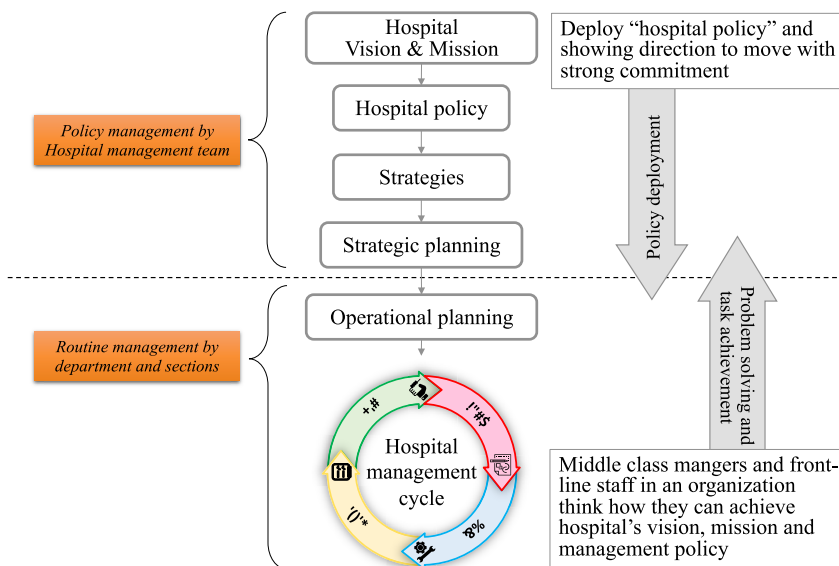


Figure 5-3: TQM concept and hospital management cycle

5.2. 5S-KAIZEN-TQM Approach toward TQM hospital

5S-KAIZEN-TQM Approach is a stepwise approach which aims to improve the following^{17,18};

- Productivity
- Safety
- Efficiency
- Moral and morale
- Internal and external client satisfaction

The above-mentioned points are improved by eliminating wastes and mistake proofing (reducing mistakes), which is described in Figure 4-4. Before starting the approach, it is important to have a positive mindset and think on how we can provide better services to our clients? In addition, what are their needs and expectations so we can improve our services in a client-centred manner?

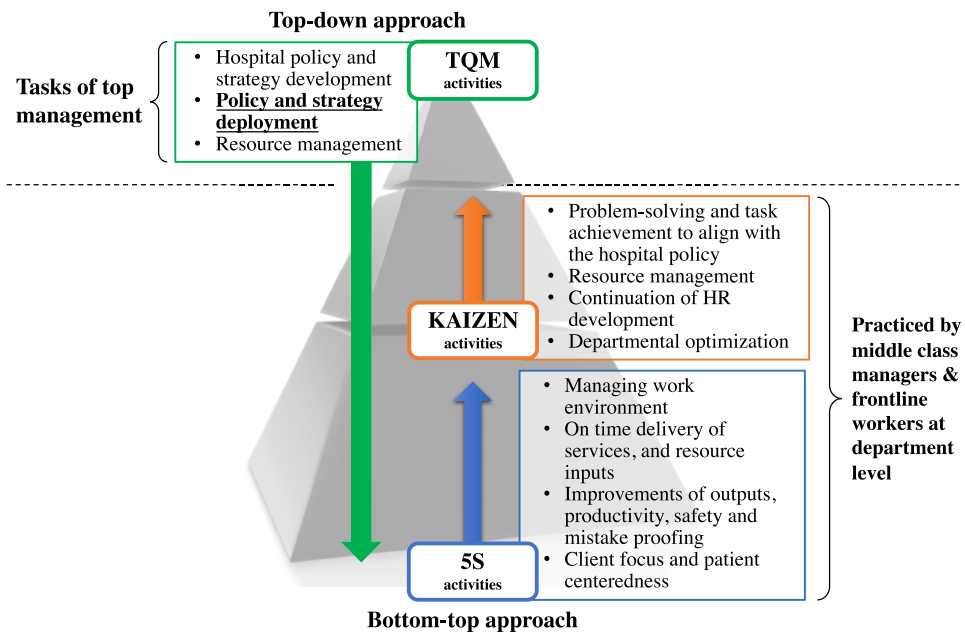


Figure 5-4:5S-KAIZEN activities towards TQM

17 Application of the 5S-KAIZEN Approach in Improving the Productivity and Quality of the Healthcare System: An Operational Research: http://psj.mums.ac.ir/article_9468_3ca7ec7e9b3ff7bc7dcc87ab3d521fc.pdf

18 The “5S” approach to improve a working environment can reduce waiting time: Findings from hospitals in Northern Tanzania: <https://www.emeraldinsight.com/doi/pdfplus/10.1108/TQM-11-2014-0099>

5.3. The 5S approach

5.3.1. What is the 5S?

Generally, 5S principles are reliable instruments for managing work environment and for staff to fulfil their day to day duties in an institution. This is not only a concept but also a set of actions that should take place systematically with the full participation of staff. Hence, 5S activities are participatory and multidisciplinary which improve the quality of both the work environment and service delivery. It is used as a basic, fundamental, systematic approach for quality and safety improvements in all types of organisations.

Originally, 5S was introduced to the Japanese manufacturing sector to improve working environments. The 5S is derived after five actions – SEIRI, SEITON, SEISO, SEIKETSU and SHITSUKE. These words can be translated into English as: (i) SORT, (ii) SET, (iii) SHINE, (iv) STANDARDISE and (v) SUSTAIN. Moreover, it is translated into, Swahili and other languages. Each S is explained briefly below:

Table 5-1: Explanation of each “S”

5S	Japanese	English	Kiswahili	Explanation	Explanation (Kiswahili)
S1	SEIRI	SORT	SASAMBUA	Remove unnecessary items that are not needed for the current work flow	Ondoa vifaa vyote visivyotumika kwenye eneo lako la kazi
S2	SEITON	SET	SETI	Arranging / organizing items according to current work flow considering efficiency and effectiveness of work	Weka katika utaratibu mzuri vifaa vyako ili kurahisisha upatikanaji wakati wa kutoa huduma
S3	SEISO	SHINE	SAFISHA	Clean up one’s workplace daily so that there is no dust on floors, tools, machines or equipment, and ensure tools, machines and equipment are in good working condition. Moreover, refill health commodities according to the set standard in Step 2	Dumisha usafi wa hali ya juu, pamoja na vifaa vya kazi katika sehemu zote za kutolea huduma na hakikisha kuwa vifaa vya kazi vinafanya kazi vizuri, na ongeza vifaa, vifaa tiba na vitendanishi vilivyopungua/kwisha
S4	SEIKETSU	STANDARDIZE	SANIFISHA	Maintain an environment where S1 to S3 are implemented in the same manner throughout the organization	Kusasambua, kuseti, na kusafisha kwa kiwango kinachokubalika iwe ni utaratibu wa kila sehemu ya kutolea huduma
S5	SHITSUKE	SUSTAIN	SHIKILIA	Maintain S1-S4 through discipline, commitment and empowerment	Fundisha na dumisha tabia njema ya watoa huduma ya utekelezaji wa kusasambua, kuseti, kusafisha na kusanifisha ili iwe endelevu

Sort–Set–Shine–Standardise–Sustain is a sequence of activities to improve the work environment to make it as convenient and comfortable as possible and thereby also improve healthcare and administrative service contents regarding preparedness, standardisation and timeliness. How 5S activities work is illustrated in the 5S conceptual framework, shown in Figure 4-5. First, S1 to S3 are practised. Next is progress; S4 activities are implemented to prevent fall-back and equalisation. Finally, S5 activities are implemented for the long term.

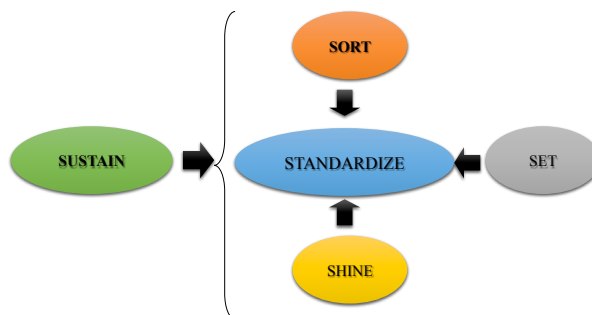


Figure 5-5: Conceptual framework of the 5S

5.3.2. Targets of 5S activities

The targets of 5-S principles are:

- Zero changeovers, leading to product and service diversification
- Zero defects, leading to higher quality
- Zero waste, leading to lower cost
- Zero delays, leading to on-time delivery
- Zero injuries, thus promoting safety
- Zero breakdowns, bringing better maintenance
- Zero customer complaints, that is client satisfaction
- Zero red ink, that is betterment of the organisations image

Furthermore, the introduction of 5S is expected to instil team culture, increase morale and motivation, and improve job satisfaction. These are simple, effective methods to organise the workplace¹⁹. Eventually, implementing 5S principles helps create a positive workforce attitude.

5.3.3. Setting targets of the 5S activities

The 5S approach works for any type of healthcare facility, department and section. There are divisions – implementation units (clusters) – which merit respective objectives as an essential functional component of an institution. Many QI approaches do not consider units providing backyard services; 5S targets all divisions in a health facility to build the foundation for quality services. Table 4-2 explains these divisions and expected outcomes.

¹⁹ Hirano and Talbot, 1995

Table 5-2: Examples on divisions and expected outcomes

Divisions/ Sections	Expected outcomes/targets of routine work
Security guard office	The facilities are protected from the outside environment.
Kitchen	The area is clean, safe and well organised. All machines are functioning. Foods supplied to in-patients are safe, nutritious and tasty.
Laundry	The area is clean, safe and well organised. All machines are functioning to produce clean linen.
Maintenance technician's office	The area is organised, and tools, materials and spare parts are well kept. Equipment all is functioning well.
Pharmacy	All medicine is managed and storage. Supplies arrive just in time, with no stock out or overstock. Medicines are administered precisely to patients.
Laboratory	All tools and machines are functioning, with reagents available for all lab tests. Standardised, quick lab tests release results swiftly.
Out Patient Department (OPD), waiting area	Less waiting time at reception. Vital signs are measured before consultation. Outpatients are nicely treated with minimum wait times.
Patient wards	Nurse station is well organised, toilets and other wards facilities are clean, and inpatients receive treatment in a comfortable environment.
Labour room	All equipment and tools ready for delivery. Normal deliveries are conducted with a safe, clean and efficient system.
Operation theatre	The area is clean and safe. All equipment is functioning and well organised. Surgical care is given with a safe, clean and efficient system.
Central Sterilized Supply Department (CSSD)	All machines are functioning to clean and sterilise tools and materials. Supply and sterilisation system support safety and cleanliness.
General storage	All items are managed and stored in a clean environment. Supplies arrive just in time, with no stock out or overstock.
Medical office, Consultation room	The area is clean and organised. The utility provides staff relaxation and readiness to work.
Administrative office	Files and papers are organised. Office is functioning as the management centre.
Matrons office	Office works as the management Centre for nursing in-charge
Hospital director's office	Office works as the centre for decision-making and management.

The above table exemplifies the target setting for clusters (implementation units) at a health facility. To have a tangible outcome, each division is required to fulfil the task for the obtainable best working condition, avoiding excessive workload of the staff in charge.

5.3.4. Implementation of the 5S activities

5S activities are usually implemented gradually, often over a one- or two-year time period. The following implementation phases and the duration of each phase are recommended for the effective and efficient implementation of 5S-KAIZEN activities. There are four phases to implementing 5S activities, namely, the preparatory phase, introductory phase, implementation phase and maintenance phase. The details of each phase are shown below. The phases of 5S implementation should be considered carefully when action plans are developed. Including many activities in the first two phases (preparatory and introductory) will delay the implementation process. Start by selecting a few target areas and prioritising activities for each targeted area according to the 5S phase of implementation leads to the successful and sustainable implementation of 5S activities.

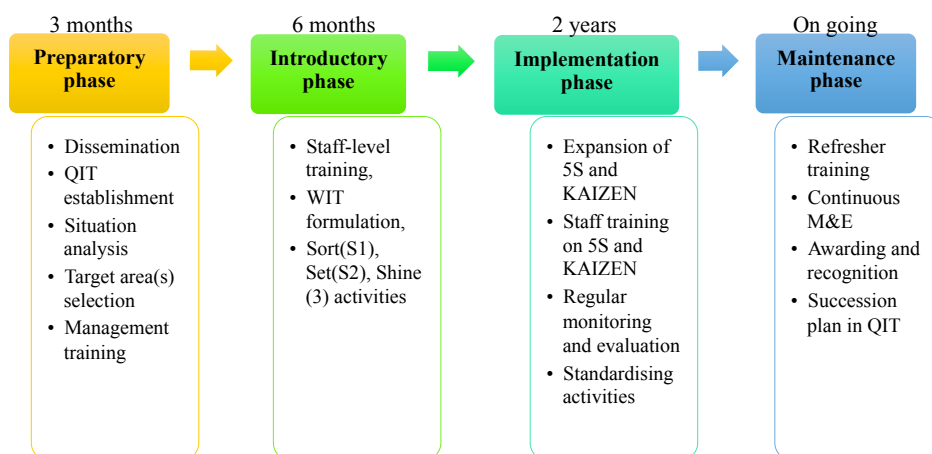


Diagram 5-6: 5S-KAIZEN-TQM implementation phases

5.3.5. Introduction stages (preparatory and introductory phases) of the 5S approach

It is recommended that hospitals planning to introduce the 5S approach follow the implementation stages described in Figure 4-7 below. It is also recommended to start with a few sections or departments for the successful introduction of 5S activities. Creating showcases in the hospital will help to train hospital staff in QI activities. In addition, QIT can learn the process of introducing the 5S approach efficiently and effectively. Therefore, refer to Table 4-4 and Figure 4-7 showing 10 steps for introducing the 5S approach.

Table 5-3: Brief explanation of 10 steps for introducing the 5S approach

Steps		Brief explanation
1	Disseminate the 5S-KAIZEN-TQM concept to other facility managers	Usefulness and benefits of 5S-KAIZEN-TQM approach need to be well understood by the hospital managers and staff in the hospital. Therefore, the dissemination of the concept must be done right after the training given by the MoHCDGEC
2	Establish QIT/QIU in the organisation	As mentioned in Chapter 1, QIT/QIU is a very important team that oversees QI activities in the hospital. Therefore, the establishment of QIT needs to be done carefully; taking in to consideration the recommended QIT/QIU selection criteria, while recognising the team as a part of the hospital organisation structure.
3	Conduct situation analysis and visit all sections in the organisation	Visit all sections and departments to see the current situation. A pictorial record is useful to keep for comparisons of before and after 5S activities.
4	Select pilot areas based on the situation analysis	<p>Pilot areas should be selected based on the following criteria:</p> <ul style="list-style-type: none"> • Less problems (few organizational problems) • Section in-charge or department head understands the 5S-KAIZEN-TQM approach well and is committed to implementing it • Staff in the section or department agree to introduce the 5S-KAIZEN-TQM approach <p>Those criteria are important to develop model areas and increase confident in QI among staff. That is, a success story is needed. Better not to create many pilot areas. Two to three pilot are better to create a showcase.</p>
5	Establish WIT in those pilot areas	WIT is also important for the day-to-day implementation and management of QI activities at section and department levels. Therefore, a member of WIT also should be selected carefully: taking into consideration the recommended criteria for selection of WIT members
6	Develop action plan based on the situation analysis	Results of situation analysis need to be utilised to develop actions plan to select pilot areas of focus.
7	Train nominated WIT members from pilot areas	Train selected WIT members on the 5S approach properly, including its purposes and what should be done daily
8	Conduct S1 to S3 activities at pilot areas	It is necessary to develop good practices of S1 to S3 activities to teach staff members in other sections. Therefore, QIT/QIU should support pilot area WIT intensively at the beginning of introducing 5S activities.
9	Share progress of 5S-KAIZEN activities to other area	After good practices are created in pilot areas, it is necessary to share with staff working in other sections. It will create interest in implementing 5S activities among staff in other sections.
10	Repeat the training for WIT and staff in other areas for further expansion	If S1 to S3 activities are successfully implemented in pilot areas, consider expanding 5S activities to other sections and departments.

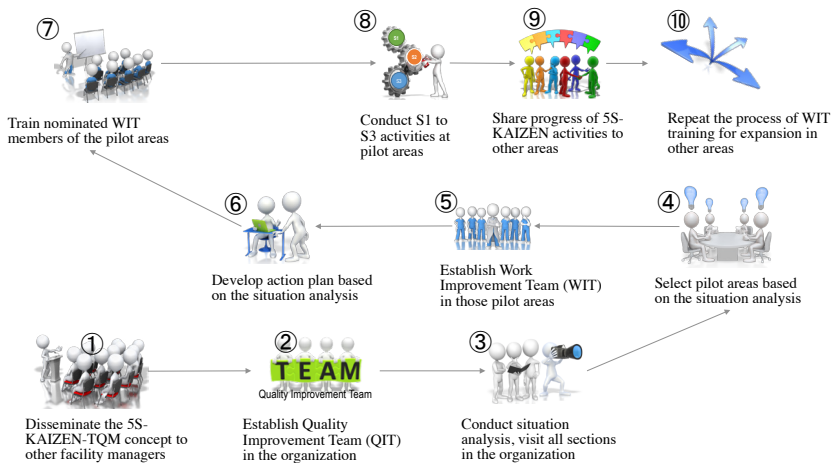


Figure 5-7: Ten steps for introducing the 5S approach to health facilities

5.3.6. Situation analysis before introducing the 5S-KAIZEN-TQM approach

To effectively and efficiently introduce and disseminate of 5S-KAIZEN-TQM, situation analysis is recommended. Start by grasping the situations of the sites in the hospital. This is done through observation, interviews, photo taking and review of documents. The results of the situation analysis will help HMT and QIT to understand the current situation of the working environment and issues affecting hospital operation, productivity and safety.

During the situation analysis exercise, the following points need to be checked and recorded. It is also important to keep a pictorial record of the situation in each section and unit in the hospital:

- 1) Visit all sections and units, including backyard services like incinerator, mortuary, workshop
- 2) Observe the physical working environment, including:
 - Ventilation
 - Water supply
 - Electricity supply
 - Cleanliness
 - The functionality of necessary facilities like toilet, fan/AC, shower, handwashing basin
 - Availability of furniture, tools, equipment
- 3) Check the storage of cleaning materials
- 4) Check the storage of commodities
- 5) Interview staff and ask them what kind of problems they are facing in the section or unit
- 6) Observe the work process/flow

After completing the situation analysis of the hospital, the findings must be well analysed. Then, a feedback session should be organised to share the results with hospital managers and staff.

How to take photos as pictorial records of 5S-KAIZEN-TQM activities

During the situation analysis, it is important to keep pictorial records of the situation that existed before as evidence of the planned changes in 5S-KAIZEN activities. Therefore, it is better to know how to take photos and keep them properly. The picture below shows a waste disposal site in a hospital. The picture was taken by a hospital staff involved in situation analysis. The staff thought the disposal site is very disorganised and dirty. Therefore, he/she approached closely and took a photo as evidence of the situation.



Image 5-1: Incorrectly taken photo of waste disposal area

At first glance, it seems the picture would be a good evidence of the existing problem. However, it is difficult to obtain other information to judge why the situation occurred. It is difficult to know the location of this area and its surroundings. Therefore, it is recommended to take the same picture from little bit far from the place/area and try to obtain the information of surroundings, which may be possible to grasp the cause of the problem somewhat from the circumstances.



Image 5-2: Correctly take photos of the same area (waste disposal point)

5.3.7. How to conduct in-house training

As mentioned in Chapter 2, training and orientation are some of the key components for introducing and disseminating 5S-KAIZEN-TQM activities. Therefore, conducting effective in-house training is very important. In that case, competent ToT are fundamental requirement, therefore Management need to select the right people (i.e. committed, showing good leadership, good communication skills etc.) to attend the ToT. The following diagram explains the ToT process of in-house training (see figure below).

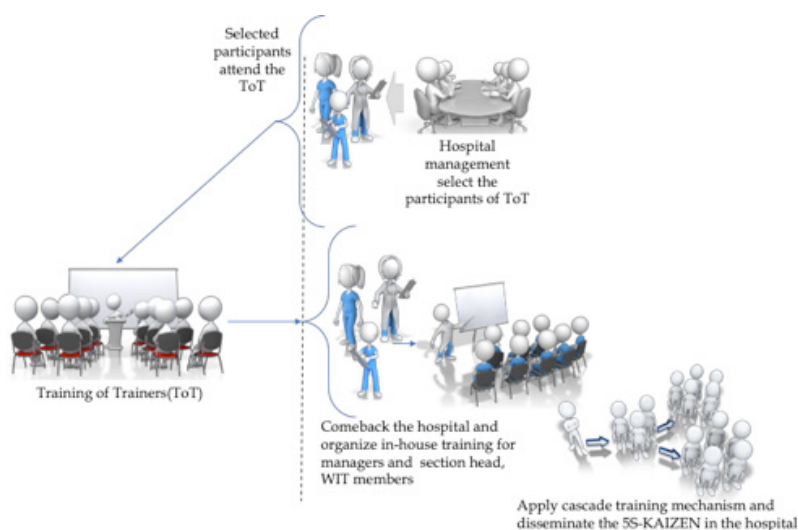


Figure 5-8: ToT process for in-house training

The methodology for conducting in-house training depends on the strategy for HRH empowerment and the availability of resources in the hospital. If resources are sufficient, in-house training can be conducted intensively for three to five days to empower staff on quality management and the 5S-KAIZEN-TQM approach. However, in case of resource shortages, it can be done by continuously educating staff, organising short study sessions in the evening etc.

5.3.8. Practice of the 5S activities

S1: Sort

Sort begins with classifying the items in a workplace, such as medical equipment, medicines and files, into three categories, as follows:

- (1) Unnecessary items: Not used at all in the current work process
- (2) Occasionally used items: Used occasionally in the current work process
- (3) Necessary items: Always used in the current work process

Then, one should remove unnecessary items from the workplace. Unnecessary items are further divided into three categories: i) working item useful elsewhere, 2) broken items that are repairable and 3) items to discard. Items that are repairable should be sent to a workshop for repair. Items to discard should be sent to an unnecessary item storage with records of the name of items, number of items and where the items are removed while items that are in good working condition but are not needed in current working place will be sent to appropriate place as per transfer procedures.

All hospitals are recommended to establish sheltered and secured storage area in a hospital. All the unnecessary items that were taken out from departments/sections are kept until proper disposal as per regulations of the facility.

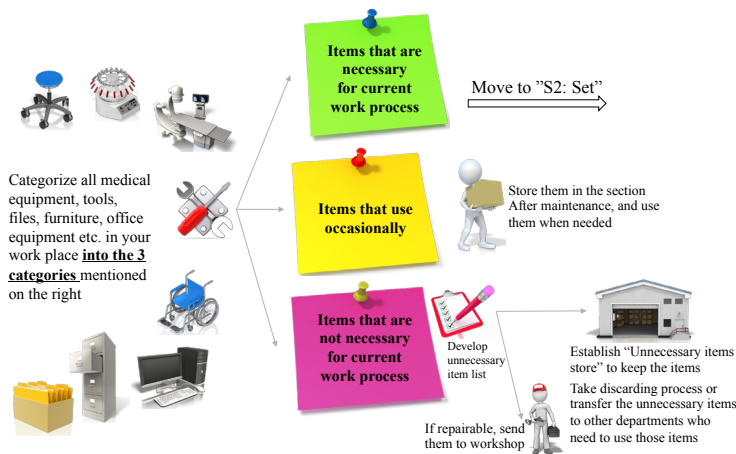


Figure 5-9: Procedure of S1

S2: Set

S2 (Set) is not just arranging necessary items beautifully; it is also arranging the items needed for the current work process to prevent mistakes and improve productivity. When arranging the necessary items, the following points need to be considered.

- (1) The workflow, which is called the *flow line*.
- (2) Apply the Can See, Can Take out and Can Return philosophy.
- (3) When deciding on storage location, it is necessary to explain it so all staff at the workplace can understand and agree with the decision.
- (4) Use tapes and labels to clarify the storage location of each item. Moreover, it is good to decide the quantity required. This is called 3 F (fixed item, fixed location and fixed number).
- (5) Ergonomics should be taken into consideration at all times during setting

[Important to consider]

Time spent searching for things wastes time and will use extra effort. In other words, it leads to a decrease in efficiency and productivity. In the case of medical facilities, everyone knows that provision of healthcare service is a battle against time to save human lives.

In addition to arranging the workplace neatly, it is necessary to remove the seven wastes and devise flow of work, arrangement of items and so on to improve efficiency, reduce mistakes and improve safety.

This lesson was learned from past experiences: The 5S activity will not continue if there is too much focus on beautification.

In departments where the discontinuation of 5S-KAIZEN activities is commonly observed, in most cases it is caused by misunderstanding of concept and purpose of 5S activities such as applying 5S tools (labelling, colour coding, zoning etc.). Human beings will not continue their actions unless they are convenient. By reducing wastefulness, items being out of stock, mistakes in work processes etc., it will greatly benefit hospitals to be able to carry out their work efficiently and safely.

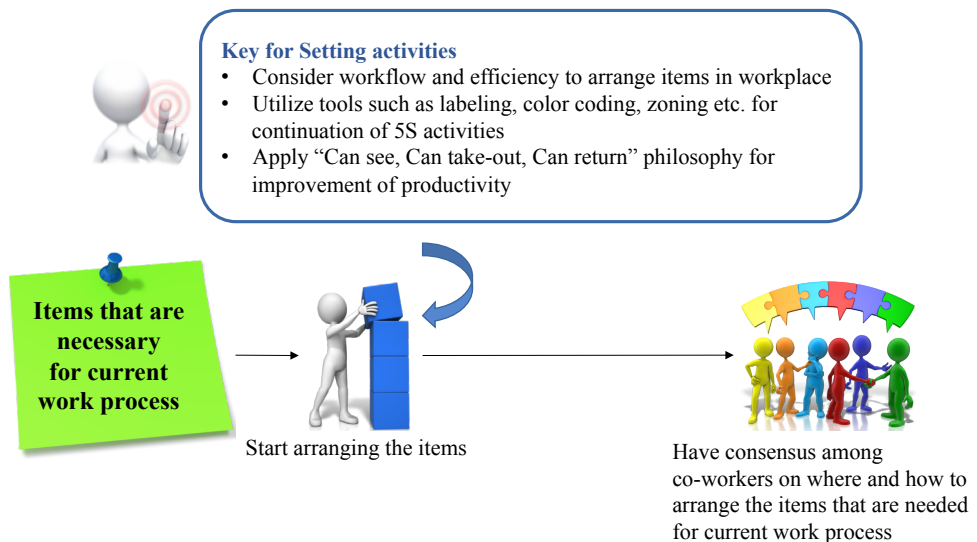


Figure 5-10: Procedure of S2



Image5-3: Example of S2 activities

S3: Shine

S3 (Shine) means one should thoroughly clean the floor, windows, desk, workbench and toilet of the workplace (or ward, medical examination room, examination room etc.). Maintenance and cleaning of equipment, and equipment necessary for providing services will keep it all ready for use at any time. In addition, the storage of cleaning tools has to be considered, they have to be stored in good and clean condition.

Cleaning will be further enhanced by creating a cleaning checklist and map so there are no inconsistencies in the facility's cleanliness. Cleaning is one of the activities enhancing IPC practices at the working environment of the hospital which is part and parcel of QI activities.

In developing countries, there are cases in which the outsourcing of in-hospital cleaning work is entrusted to outside contractors. However, in many cases, contractors are only around non-infected areas, such as hospitals, aisles and administrative office buildings. In other words, staff themselves must participate in cleaning for wards and other areas.

Therefore, while explaining the importance of staff involvement in cleaning, it should be understood that it goes hand in hand with maintaining hospital equipment. Outsourced cleaners are also encouraged to participate in 5S activities so they need to be oriented.



Key for Shining activities

- Clean your workplace everyday before going back home.
- Develop and follow regular cleaning and maintenance schedule
- Store cleaning tools properly
- Segregate medical waste properly



Figure 5-11: Procedure of S3



Image 5-4: Example of shining

S4: Standardize

When healthcare personnel discuss standardisation, it is easy to think *standardisation* refers to a certain criterion of practicing all 5Ss. Instead, *standardize* in 5S activity aims to thoroughly continue and maintain the activities of S1 to S3 that is sort, arrange, keep the cleanliness and maintenance (keeping something in good condition).

At the facility level, it is easy for everyone to understand the standardisation of sort and set using colour codes and signboards. We will promote the maintenance of these by notifying staff about their meanings and rules. Traffic signals are good examples. Many people understand that red signifies danger and means they should stop. Yellow means caution, and blue connotes safety. Likewise, anyone with a driver's licence understands traffic signs. It is the same in the hospital. Deciding the rules necessary for standardisation and disseminating them to staff and facility users will effectively continue 5S activities. Creating standard operating procedures (SOPs) and a state in which everyone does the same thing leads to standardisation of the workplace.

Key for Standardization activities

- Develop mechanism to standardize S1-S3 implementation for continuation
- Standardization will leads equalization of activities = "Production leveling and smoothing"

Standardization is useful for;

- Easy implementation of S1 to S3 activities
- Equalization process output
- Everyone's participation

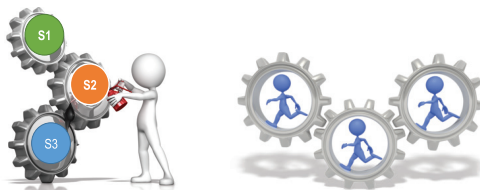


Figure 5-12: Procedure of S4



Image 5-5: Example of shining

S5: Sustain

S5 (sustain) aims to acquire a good habit so staff continue practising S1 to S4 without falling back to previous situation²⁰. In another way, discipline follows the process of proficiency → habituation → behaviour change. As a mechanism to acquire good habits, it is necessary to try to ensure that 5S activities become a habit and culture in the workplace through various activities, such as intriguing the staff and sharing 5Ss benefits. However, it is not easy to make that a custom or part of the workplaces culture. Staff who have been working for many years resist to changes and often say that “Why do we have to change? We have been doing this for many years”. It is important to know that not everyone wants to change.

The front-line staff and hospital administrators might show a rejection reaction. To overcome this issue, employees should be urged to understand growth necessitates change and just because something has been done for a long time does not mean it is correct. All workers need to think that, together, they can create the corporate culture key to S5 (sustain). If MoHCDGEC introduces 5S-KAIZEN-TQM to facilities nationwide, it is also important to use external mechanisms—for example continue to participate in the Ministry of Health’s training, attend and report to progress report meetings and accept external evaluations and study tours exchange visits.

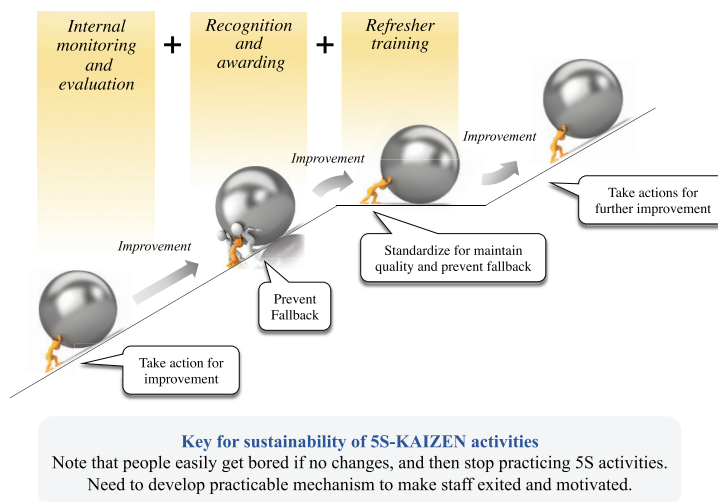





Figure 5-13: Procedure of S5

20 <http://leansixsigmadefinition.com/glossary/5s/>

21 <https://world-class-manufacturing.com/5S/Shitsuke.html>

Table 5-4: Explanation of S5 activities

Activities for S5	Brief explanation of the activity	Image
Establishment of 5S corner	The 5S corner is a place to share information on 5S activities and other quality improvement activities conducted in the hospital. Normally, it is placed where all hospital staff can see it, with information on the 5Ss, a poster on KAIZEN activities, hospital monitoring/evaluation results, training information etc.	
Periodical monitoring and progress reporting	There are external and internal M&E activities. In both cases, the aim is to monitor and evaluate implementation statuses and further improvements through technical guidance. It is also effective to evaluate the degree of progress regularly and visualise by digitising and making a graph.	
Recognition / Rewarding (Awarding)	A system to recognise the efforts of implementers and motivate willingness to implement 5S activities. However, precaution should be taken to avoid creating unnecessary competition among departments in the hospital.	

5.4. KAIZEN approach

5.4.1. History of KAIZEN approach

KAIZEN history goes back to the 1930s. Kiichiro Toyoda, founder of Toyota Motors, derived KAIZEN from corporate management methods and inculcated them in 1935s Toyota Principles. Specifically, the Quality Control workshop was held in 1949, and then Toyota introduced the Statistical Quality Control (SQC) method. The year 1951 is considered as the introduction of the KAIZEN proposal with which Toyota introduced the creative club proposal system, imitating quality improvement activities practised at Fords production factory; hence, this is considered the time of its creation. In 1961, Toyota Motors stopped using SQC and introduced Total Quality Control (TQC) to comprehensively improve the quality of the entire company, including an overall review of the company's management, considering change over time. Hence, established a work improvement system for teams, including the construction of a QC circle.

5.4.2. Difference between KAIZEN and Continuous Quality Improvement

“KAIZEN” can be defined as a problem-solving process with continual improvement of working practices and management for departmental optimization, towards Total Quality Managed Organization (hospital).

KAIZEN is an activity that removes MURI (overburden□, MURA (unevenness) and MUDA (waste) from work processes and continues to create products or services valuable to customers and a conducive to work. Moreover, KAIZEN is an activity and process in which all organisation's workers participates while managing responsibly with wisdom and ingenuity. Continuous Quality Improvement (CQI) is a theory of organisational management, and includes management methodology. Both do not deal with a problem after an incident; however, they attempt to improve the quality of service by checking and reviewing work processes and considering the satisfaction of both internal and external customers. Additionally, CQI is a top-down approach, from management to workers. However, KAIZEN uses the wisdom of frontline workers; it is a bottom-up approach.

5.4.3. KAIZEN concepts

When MURI, MURA and MUDA are found in the work process and problems are identified, it is important to think about the implementation of KAIZEN concepts in the following order:

- 1) First, try to stop or quit the work process, which does not create value.
- 2) If one cannot stop or quit, one should try to reduce the frequency or number of times that problematic processing occurs.

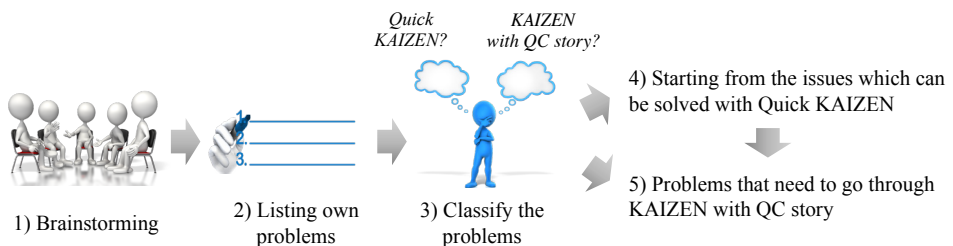


- 3) If one cannot reduce, one should change how to do something, such as reviewing the method.

However, it is important to understand that some elements can be changed, depending on the subjects of KAIZEN activity and some cannot, that is non-targets of KAIZEN activity.

5.4.4. Preparation for problem solving

At the work site, we will solve problems using KAIZEN as follows. Having acquired knowledge and skills on KAIZEN, WIT will organise a section meeting and where necessary appoint KAIZEN-team. Then follow this process in preparation;



- 1) Brainstorm with everyone working in the department
- 2) List own problems in the work place
- 3) Classify the problems raised in brainstorming into two KAIZEN types; one should consider the size of the problem, the ease with which it can be resolved and then if Quick KAIZEN is necessary or the KAIZEN with QC Story is needed
- 4) Use the solutions, start solving the problems, which are categorised according to Quick KAIZEN to understand the successful experiences that led to motivation among employees
- 5) Subsequently, if complicated problems remain, apply the process called KAIZEN with QC Story

5.4.5. Types of KAIZEN

When KAIZEN activities are practised, it is necessary to consider the level of complication of the problem or issues and apply the appropriate type of KAIZEN methodology. There are two types of KAIZEN methodologies: 1) Quick KAIZEN and 2) KAIZEN with QC Story. Quick KAIZEN is usually applied to non-complicated issues, and KAIZEN with QC Story is used for complicated issues. A detailed explanation of each KAIZEN methodology follows.

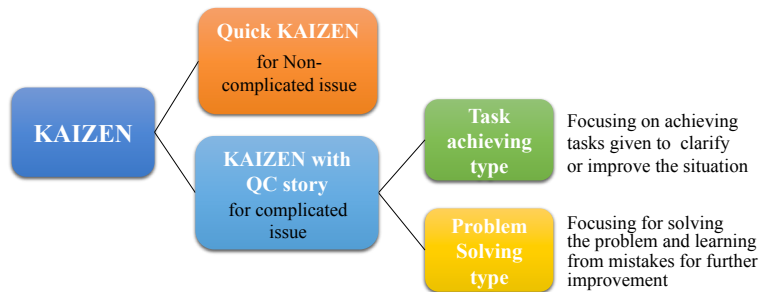


Figure 5-14 (1): Types of KAIZEN

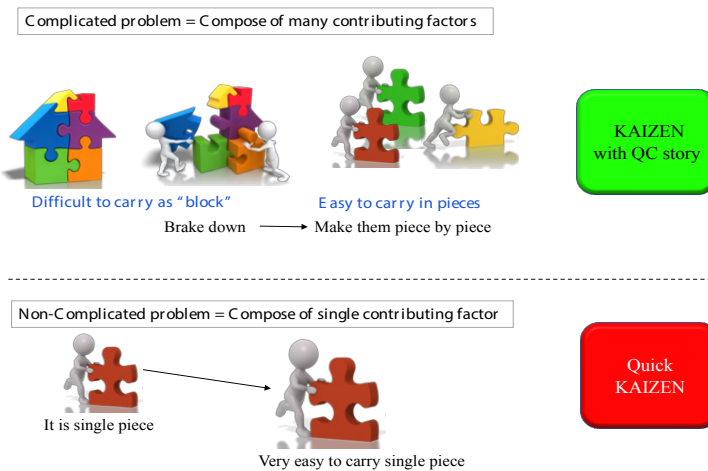


Figure 5-14 (2): Types of KAIZEN

5.4.5.1. Quick KAIZEN

Quick KAIZEN is applied to small, simple problems. There are so many small problems found in our working environment. However, if staff have been working at the same workplace for a long time, many of them do not recognise small problems and overlook them. Therefore, it is important to have mechanisms to watch those small problems and apply Quick KAIZEN to improve the working environment within a short time, so the effects can be seen immediately. Quick KAIZEN does not need investments in resources. A maximum of one to two days to complete an action is needed; the person who suggested the change should be the person who implements the action. The benefits of Quick KAIZEN are as follows:

- It can rapidly improve the work environment and healthcare services.
- It can grow confidence among healthcare workers (by accumulating small and continuous successful experiences).

- It can cultivate a positive mindset among healthcare workers.
- It can strengthen record-keeping habits among healthcare workers.

It is strongly recommended that Quick KAIZEN activities be recorded on a single paper, called a *KAIZEN Memo* or *Good practice sheet*. This kind of record will help QIU to share good practices with other sections and departments to obtain benefits as an organisation. It is the duty of WIT and QIT/QIU to set up a mechanism to ensure continuous practice of a successful Quick KAIZEN. An example of Quick KAIZEN Memo is shown below.

Quick KAIZEN Everyday a little bit higher	Unit/Ward/Department: Date of implementation: / / 20..... Head of WIT: Member of WIT:			
	Before KAIZEN	After KAIZEN		
(Picture of situation before KAIZEN)		(Picture of situation after KAIZEN)		
Description of the situation before:		Description of the situation after:		
Benefits from this Quick KAIZEN: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <input type="checkbox"/> Improve movement/transportation <input type="checkbox"/> Reduce staffs' work burden <input type="checkbox"/> Improve workers' safety </td> <td style="width: 50%; border: none;"> <input type="checkbox"/> Improve productivity <input type="checkbox"/> Improve patients' safety <input type="checkbox"/> Others: </td> </tr> </table>			<input type="checkbox"/> Improve movement/transportation <input type="checkbox"/> Reduce staffs' work burden <input type="checkbox"/> Improve workers' safety	<input type="checkbox"/> Improve productivity <input type="checkbox"/> Improve patients' safety <input type="checkbox"/> Others:
<input type="checkbox"/> Improve movement/transportation <input type="checkbox"/> Reduce staffs' work burden <input type="checkbox"/> Improve workers' safety	<input type="checkbox"/> Improve productivity <input type="checkbox"/> Improve patients' safety <input type="checkbox"/> Others:			

Diagram 5-15: Example of Quick KAIZEN memo



Quick KAIZEN Everyday a little bit higher	Unit/Ward/Department: Ward XX Date of implementation: January 2016 Head of WIT: XXXXXXXX Member of WIT: XXX, XXX, XXX, XXX, XXX, XXX			
	Before KAIZEN	After KAIZEN		
				
Description of the situation before: Although we had the place for keeping our home clothes and uniforms, we had risks for transmitting infections among clothes, also did not have individual space for own clothes.		Description of the situation after: We separated clearly the places for home clothes and uniforms. We are also given individual hanger to keep own clothes.		
Benefits from this Quick KAIZEN: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <input type="checkbox"/> Improve movement/transportation <input type="checkbox"/> Reduce staffs' work burden <input checked="" type="checkbox"/> Improve workers' safety </td> <td style="width: 50%; border: none;"> <input type="checkbox"/> Improve productivity <input type="checkbox"/> Improve patients' safety <input checked="" type="checkbox"/> Others: Improve IPC, Improve staff satisfaction </td> </tr> </table>			<input type="checkbox"/> Improve movement/transportation <input type="checkbox"/> Reduce staffs' work burden <input checked="" type="checkbox"/> Improve workers' safety	<input type="checkbox"/> Improve productivity <input type="checkbox"/> Improve patients' safety <input checked="" type="checkbox"/> Others: Improve IPC, Improve staff satisfaction
<input type="checkbox"/> Improve movement/transportation <input type="checkbox"/> Reduce staffs' work burden <input checked="" type="checkbox"/> Improve workers' safety	<input type="checkbox"/> Improve productivity <input type="checkbox"/> Improve patients' safety <input checked="" type="checkbox"/> Others: Improve IPC, Improve staff satisfaction			

Diagram 5-16: Good practice of Quick KAIZEN and its record keeping

5.4.5.2. KAIZEN with QC story

As we repeatedly go through quick KAIZEN, simple problems will gradually be solved. Consequently, problems that are complicated, time consuming and costly are visible. To solve these problems, we can use the tools for data analysis called QC tools and apply the statistical processing method, with which we can conduct the evidence-based problem-solving process. These are referred to as the *KAIZEN Approach with QC Story*, which solves complicated problems, reduces them and prevents their recurrence. The Union of Japanese Scientists and Engineers explains the meaning of using the QC Story: proceeding rationally on problem solving and task fulfilment initiatives, necessary arrangements to obtain the correct conclusion and effect²². This KAIZEN process needs to go through the seven steps described in the graphic below.

QC tools

As mentioned above, this data analysis tool is necessary for conducting quality KAIZEN activities. The QC tool has two categories: 1) seven basic QC tools and 2) seven new QC tools. The seven basic QC tools are mainly for analysing quantitative information, and the seven new QC tools are for analysing qualitative information.

Table 5-5: Seven basic and new QC tools

The 7 basic QC tools		The 7 new QC tool	
Pareto chart	Different by item, arrange them in the order of magnitude of occurrence frequency, and show the cumulative sum	Affinity diagram	Regarding a chaotic problem, we organise much collected data by affinity and clarify the structure of the problem.
Cause–effect diagram	A diagram that systematically represents the relationship between results and causal systems	Interrelation ship diagram	Regarding problems in which generation factors are complicatedly intertwined, we link these causal relationships with arrows and pursue the main factor.
Control chart	Diagram with upper control limit line and lower control limit line, in which consecutive observations or values of certain statistics in groups are plotted, usually in the order of time or sample number	Tree diagram	To solve the problem, we find appropriate means by organising the purpose and means.
Check sheet	A list used for checking the individual elements that are working correctly, are being done, constituting the work	Matrix diagram	arrange two elements in two dimensions of rows and columns and focus on that intersection to find a clue for problem solving

22 Katsuya Hosotani (2018), “The QC Problem Solving -Approach, Solving Workplace Problems the Japanese Way”, ISBN-13: 978-4817196385

The 7 basic QC tools		The 7 new QC tool	
Histogram	A graphical representation of the frequency distribution of the measurements weighing characteristics. <i>Stratification</i> means to divide the population into several layers. The stratum is one kind of population and has no mutual intersection. The combination of the respective layers coincides with the population.	Arrow diagram	If many tasks to solve the problem are complicatedly intertwined, the relation and schedule of each work is represented by a network diagram
Scatter diagram	Graphic representation with two characteristics plotted on the abscissa and the ordinate with observation values striking point	Process Decision Program Chart	Predict unforeseen circumstances. When planning is implemented, list the alternatives when an unexpected situation occurs, and show the process to achieve the figures goal.
Graphs	Data is shown in the figure to see the data, to compare its amount and to clarify the state of change	Matrix data analysis	Organise the numerical data in the matrix diagram into a two-dimensional figure and find a clue for problem solving.

Difference between problem-solving QC story and task-fulfilling QC story

KAIZEN activities conducted with a QC story can be divided into two types, the problem-solving type and the task-achieving type. In the case of developing countries, there are many cases in which the optimal state has not been reached and it is necessary to utilise a problem-solving QC story to overcome these situations. Therefore, the target of solving the problem is set at 80% as per Pareto chart. Continuing to solve the problem will bring one closer to the ideal situation. However, the proper way to proceed with CQI without satisfying the situation is setting up the next goal (task), aiming for further improvement and tackling that goal.

The difference between the two types is shown in Table 4-6 There are websites that explain implementation with eight and 10 steps on the Internet, but there are no differences between them, as the latter version is written with the following seven steps subdivided. Incidentally, Toyota incorporates target setting as a single step after step 2 and standardises it as eight steps.

Table 5-6: Categorization of QC story

Steps	“Problem-solving” type	“Task-achieving” type
1	KAIZEN theme selection	KAIZEN theme selection
2	Situation analysis	Situation analysis and target setting
3	Cause analysis	Development of countermeasure
4	Development of countermeasure	Development of successful scenario
5	Implementation of countermeasure	Implementation of successful scenario
6	Checking effectiveness	Checking effectiveness
7	Standardisation	Standardisation

How to carry out the Problem-solving type QC story

This fundamental process recognises problems in the field and solves them effectively and efficiently. First, it is necessary to decide the KAIZEN theme that should be tackled in step 1. Next, based on the selected theme, it is important to explore the size of the problem and the factors that contribute to it. Then, one should clarify the major contributing factors that must be removed and explore the cause of those factors in step 3. In Step 4, one should identify the countermeasures against the identified causes, confirm the feasibility of each countermeasure, determine measures that can be implemented and execute the measures determined in Step 5. After implementing countermeasures for a certain time, one should check the effect of the countermeasures in Step 6.

Data and information regarding Kaizen activities should be collected by using the same method as the data collection method used in step 2. One should use that data and information to compare the scenario before and after Kaizen activity and verify effects. In addition, we will confirm which of the measures taken has resulted in the effect. Finally, we standardise the activities judged effective in Step 7, create a mechanism for their continuance and aim to prevent recurrence.

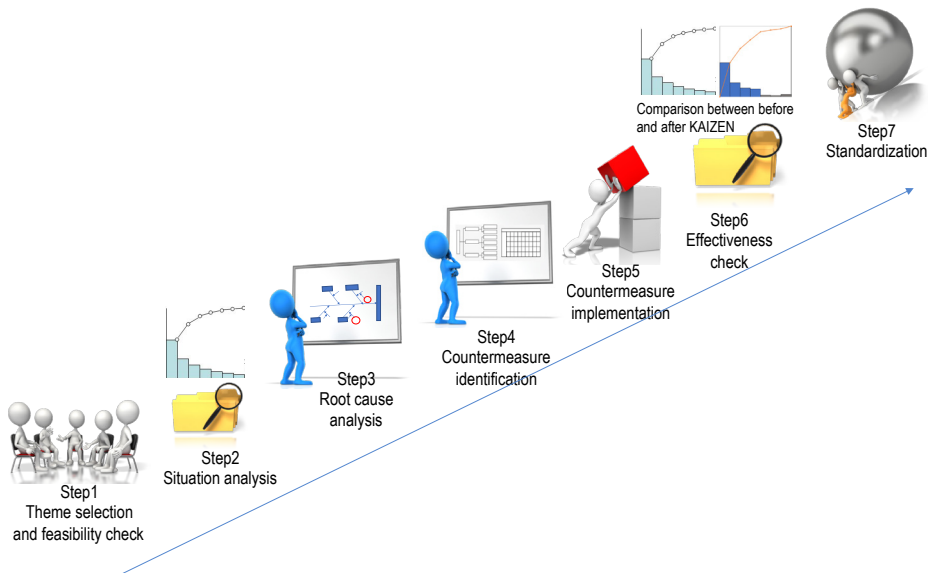


Figure 5-17: Seven steps in Problem-solving type QC story

Step 1: KAIZEN Theme Selection and feasibility check

This step starts with a discussion on the difficulties that employees and clients are facing in their workplace, after which a KAIZEN theme should be selected that can be improved within a given time period with existing resources. During the brainstorming meeting, possible KAIZEN themes (called *KAIZEN suggestions*) will be proposed by employees working in the department, section or unit based on:

- Claims from clients/patients
- Mistakes often happening
- Work processes that take time and are hard to do
- Medicines and equipment disturbing the smooth practice of routine work

Several KAIZEN themes might be suggested during the brainstorming meeting. From those suggested KAIZEN themes, it is necessary to evaluate the feasibility of each suggested theme. KAIZEN suggestions should be expressed as ideals, not with negative expressions. Writing in positive expression will help the implementers to visualise what they want to achieve and thus encourage participation and ownership of the processes. For example, if the problem is the wait time in the OPD is too long, it is necessary to change the sentence to a form expressing the ideal situation, such as the waiting time in the OPD has been shortened.

The feasibility of a KAIZEN theme can be evaluated based on the following criteria:

1. **Impact:** The impact when the problem is solved or reduced will be great.
2. **Urgency:** The theme must be tackled immediately.
3. **Realisation:** Is it possible to tackle this issue with existing resources (e.g. costs, human resource time, information availability etc.)?
4. **Burden to service users:** The issue is less burden to service users.

The matrix diagram below is explained in Chapter 6, Tools useful for 5 S-KAIZEN activity.

Date of implementation

KAIZEN suggestions	Impact	Urgency	Resources	Burden	Feasibility
Waiting time at OPD is reduced	3	2	3	3	11
Waste segregation is improved	3	2	3	3	11
Specimen collection mistake is reduced	3	3	2	2	10
Giving wrong medication is reduced	3	3	2	2	10
Working area is expanded	2	1	1	1	5

Scale 3: Large, High, Easy 2: Moderate 1: Small, Low, Difficult

Diagram 5-18: Example of Matrix diagram

In the matrix diagram above two themes score high. In such case if there is sufficient human resource in the section both can be done at the same time (two teams). Where such resources are not available then reprioritization and consensus have to be reached.

It is necessary to write *Problem Statement* to clarify the problem with the selected KAIZEN theme. That is, what kind of problem is occurring, and what objective is one aiming for? If a KAIZEN theme is Waiting times have been shortened, the problem identified was Waiting times are long. An example of the situation explanation in this case is as follows:

Problem statement:

Wait times in the morning in the OPD are long, and there are many complaints from patients. Since there are variations in the waiting time in each section, the patient flow is stagnant, and the work process cannot proceed smoothly. Therefore, OPD employees aim to shorten wait times in the department to improve outpatient satisfaction and facilitate the work process.

This problem statement is very important in finding the contributing factors in Step 2, the situation analysis. Therefore, one should ensure the problem statement of the selected KAIZEN theme is stated clearly. The problem statement should therefore include the following;

- What is the actual problem (what is happening)
- How this is affecting service provision
- Why we need to solve the problem

Step 2: Situation Analysis

In Step 2, it is necessary to grasp the status of the selected KAIZEN theme. In other words, it is necessary to discern the essence of the problem. As mentioned above, complicated problems are comprised of various-sized contributing factors. In the KAIZEN process, the easy way to solve problems is to break them down into contributing factors and solve them factor by factor. In fact, since we must find a solution based on evidence, we must clarify the occurrences frequency and the characteristic value of each factor.

(1) Determine the characteristic value of the constituent factor of the selected KAIZEN theme

The *characteristic value* is a value expressing the selected KAIZEN theme. The appropriate scale of the characteristic value varies depending on the selected KAIZEN theme. The problem-solving type of QC story concentrates on reducing the occurrence frequency of problems, so be sure to check the frequency of problems as one of the characteristic values. In addition, cost, time, resource input etc. can be measured as characteristic values of the KAIZEN theme. For example, regarding long waiting times for outpatients, the characteristic value of this problem is time. In defining the characteristic value (KAIZEN theme specific verifiable indicator) think of the items (values) which are measurable that will show the possible benefits of implementing the KAIZEN with QC story in the section.

(2) Identify factors contributing to the problem

Factors contributing to problems influence their manifestation. A simple example is the breakdown of a car. When this occurs, it is unknown whether the engine, the driving system or the electrical system is faulty. These are all factors of the problem that a car has broken down. Hence, when a problem occurs, it is necessary to understand what is going on.

In the example of Step 1, there was a problem concerning long wait times at the OPD. This should be separated into contributing factors, as there were different sections and units involved in the workflow in the OPD. We also do not know which sections patients are kept waiting for a long time. Therefore, by checking the workflow in the OPD, measuring the waiting time at each section for a certain period of time and calculating the average waiting time, it is possible to determine the section in which patient flow is stagnant. Please note that identifying the contributing factor is one of the most confusing processes in the KAIZEN process. Therefore, one should be careful when teaching others. Using the problem statement stated in Step 1 is helpful to identify the appropriate contributing factors.

(3) Collection of data and information on the frequency of occurrence of the problem's factors

It is necessary to observe and investigate the current situation, work process etc. One must continue to explain as an example the problem of long waiting times at the OPD. The frequency of occurrence of the contributing factors and the waiting times of OPD (i.e. reception, consultation room, pharmacy, laboratory and accounting) are measured for a certain period, and the average value is comparatively given. The data collection method of this example is the observation and time survey. The time required for the data collection varies depending on the frequency with which contributing factors occur.

Please note that, if contributing factors occur frequently, it is possible to obtain sufficient data within a short time; if they occur less frequently, the data collection period must be extended.

Date	Waiting time (min)	Reception	Doctors chamber	Dispensing area	laboratory	Casher
September 01, 2018	Average waiting time	35	25	15	19	30
September 02, 2018	Average waiting time	30	13	10	25	19
September 03, 2018	Average waiting time	33	25	15	19	25
September 04, 2018	Average waiting time	40	30	20	14	19
September 05, 2018	Average waiting time	38	28	12	15	30
September 06, 2018	Average waiting time	32	31	14	13	19
September 07, 2018	Average waiting time	33	32	10	13	18
September 08, 2018	Average waiting time	38	38	15	19	19
September 09, 2018	Average waiting time	30	21	14	45	14
September 10, 2018	Average waiting time	35	20	13	19	18
	Average in 10 days	34.4	25.6	13.8	20.6	22.6
Total Frequency		10	9	1	2	3

Note: In the event of waiting 20 minutes or more is counted as "occurrence of waiting time"

Figure 5-19: Example of Data collection for situation analysis

Note that the method of collecting information varies greatly depending on the KAIZEN theme. If using the information and data that are regularly recorded, it is possible to apply the retrospective method to collect information and data. This will save time and effort in collecting new data. However, if information and data are not collected regularly, one must collect them again. In this case, the prospective method is applied for data collection, and it is necessary to spend a week to a month collecting data.

(4) Determine the priority of the factors to be solved by Pareto analysis

The collected data and information should be analysed properly. Some tools that are useful for the accurate statistical situation analysis used in the KAIZEN process are called *QC tools*. One is the Pareto Chart. In Step 2, a Pareto Chart is useful for the prioritisation of target(s) for problem solving, when various contributing factors exist. Visualising the frequency of incidents that contribute to a problem is also helpful for decision making concerning the prioritising of targets for problem solving. A Pareto Chart can identify the contributing factors that need to be focused on for improvement. It means identifying high-frequency contributing factors and factors that most affect the work process.

To make a Pareto Chart correctly, it is necessary to count the frequency of incidents that are causing or contributing to the problem (selected as KAIZEN theme) and calculate the accumulation ratio of incidents, as in the table below:

#	Contributing factors	Frequency	Cumulative frequency	Cumulative %
1	The number of days waiting for an average of 20 minutes or more at the reception	10	10	$10 \div 25 = 40.0\%$
2	The number of days waiting for an average of 20 minutes or more outside of the consultation room	9	19	$19 \div 25 = 76.0\%$
3	The number of days waiting for an average of 20 minutes or more at the cashier	3	21	$21 \div 25 = 88.0\%$
4	The number of days waiting for an average of 20 minutes or more at the laboratory	2	24	$24 \div 25 = 96.0\%$
5	The number of days waiting for an average of 20 minutes or more at the dispensing area	1	25	$25 \div 25 = 100\%$
Total		25	---	---

Figure 5-20: Example of calculation of cumulative frequency and cumulative %

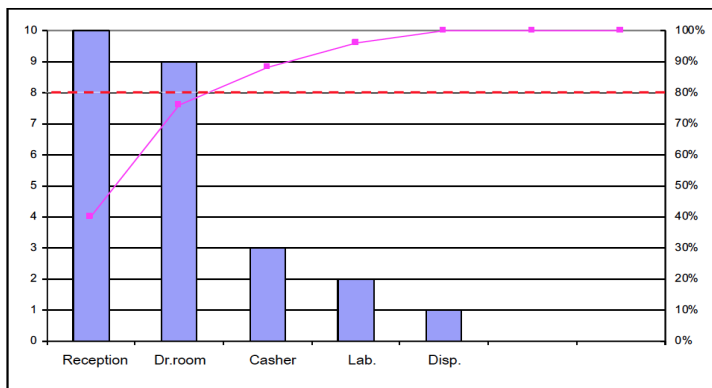
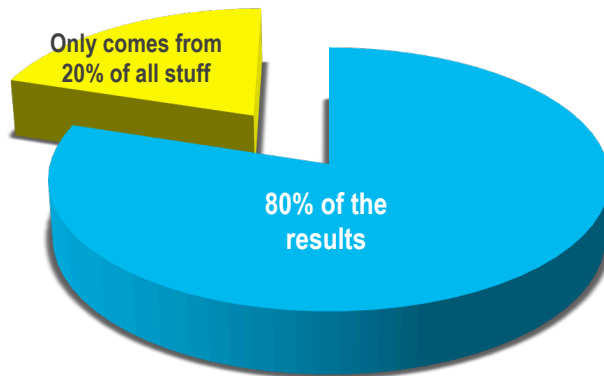


Figure 5-21: Example of Pareto chart (developed from Table 4-9)

Pareto rule

In terms of quality improvement, the Pareto chart tells us that a large majority of problems (80%) are produced by a few key causes (20%). This technique helps to identify the top 20% of causes that need to be addressed to resolve 80% of the problems. In the Pareto chart above, where the dotted line intersects the line graph is the cut-off point. All those bar-graphs on the left side of the cut-off point represent 20% of causes that need to be addressed to solve 80% of the problem (vital few).



There is a free tool for making Pareto charts on the Internet, and it is recommended for making work easier and simpler. (See <http://www.vertex42.com/ExcelTemplates/pareto-chart.html>.)

Step 3: Root Cause Analysis

The major contributing factor to Step 2 to address a problem is the need to identify its cause. Step 3 explores the cause of the prioritised factor in the previous step and reveals the causal relationship. This process is accomplished using the cause—effect diagram (Fishbone diagram), which is one of the QC tools.

The criteria for selecting high-priority factors are extracted from the left of the Pareto chart according to Pareto rule, in the order of the frequency at which the cumulative percentage is greater than or close to 80%. As an example (see Table 4-9 and Figure 4-18), contributing factor 1 (waiting time in the reception area) accounted for 40% of 10 cases, and the cumulative percentage of contributing factor 2 (wait before the consultation room) will be close to 76% (almost 80%), so these two are the contributing factors to focus on in the case of the example. Accordingly, one should create a cause-effect diagram for each of these and explore the cause. If there are three factors to focus on, three cause-effect diagrams are required. If we take too many factors as prioritised, there could be a problem with how we identify contributing factors. Therefore, it is best to consider repeating Step 2.

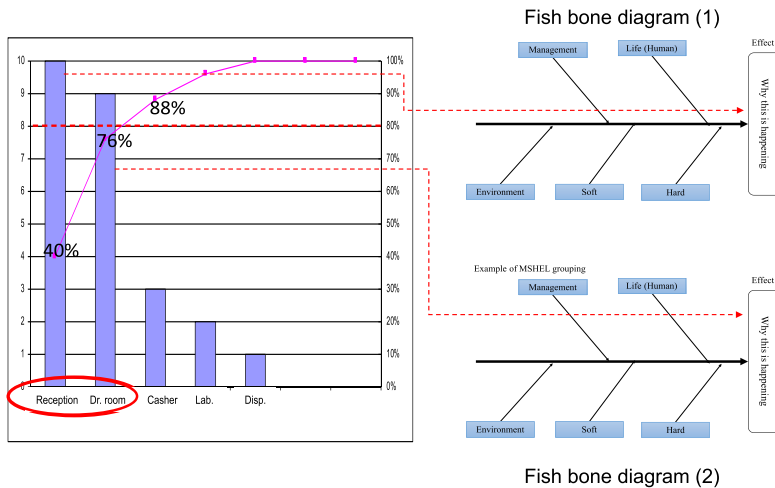


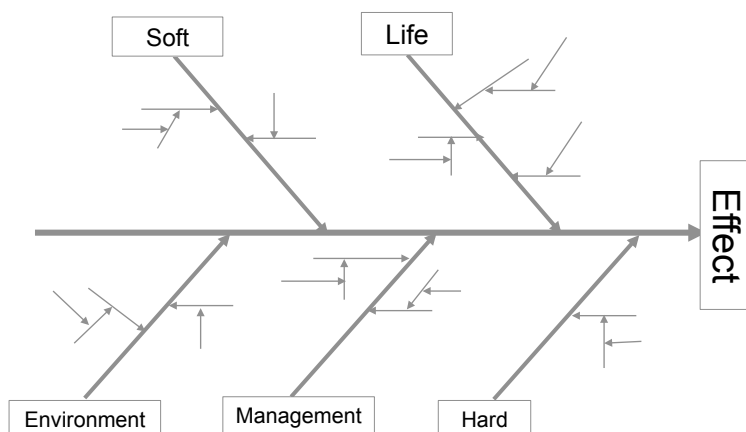
Figure 5-22: Connection between QC story Step 2 and Step 3

Explain the process of performing a root cause analysis:

- (1) First, change the prioritised contributing factor into the question format. Use the same example of long waiting times. The frequency of occurrence of long waiting times in the reception area was prioritised in Step 2. In this case, we can write the question Why are there long waiting times in the reception area? and position that question as the head of the fish on the right end of the fishbone diagram. Please note the head of the fish is the prioritised contributing factor, not the KAIZEN theme.
- (2) Next, brainstorm about possible causes, not discussion. Each WIT member will contemplate possible causes, which are related to the head of the fish, to ask Why this is happening? Asking questions like the one described above might be the answer, for example Visitors do not follow the rules. However, in this sentence, it is difficult to know what rule is not followed or how it is not kept. Therefore, please add more information and try to describe in concrete terms, for example Visitors do not follow the rules of presenting a consultation ticket at the reception area. In addition, we do not discuss whether the idea issued here is appropriate.
- (3) Next, to facilitate the creation of the fishbone diagram, group the causes that were identified through brainstorming. The cause grouping is like that shown in the figure below. These are grouped into personnel issues, methods, items related to methods, items related to equipment and equipment itself, issues related to health systems etc.

There are two ways to group the cause. One is MSHEL (Management-Soft-Hard-Environment-Life) method, which is often used in the service industry, and another is 4M (Man-Machine-Method-Materia) method, which is used in the manufacturing industry. However, either one can be used. The possible cause written in process ② is distributed

using the above grouping. For example, the cause reception employee's weak patient handling skills is related to employee's ability, so it is grouped into Life or Man. However, the above example, does not observe the rule that a visitor presents a consultation ticket at the reception area can be grouped into Life or Man as well as Soft or Method. If one cannot decide how to group an item, it can be put in both groups. If one does not know how to sort issues, please refer to the table below.



Grouping by

- **MSHEL:** M(Management), S(Soft), H(Hard), E(Environment), L(Life) for service sector
- **4M :** M(Man), M(Machine), M(Material), M(Method) for manufacturing sector

Figure 5-23: Grouping of causes on the fishbone diagram

Table 5-7: Grouping of the causes

Grouping style		Examples
MSHEL grouping	4M grouping	
Management	---	Planning, Strategy, Monitoring, Inventory
Soft	Method	System, Methodology, Mechanism, flow
Hard	Machine/Materials	Commodities, Medical equipment, Tools, Furniture etc.
Environment	---	Facility environment (water, electricity supply, smell, ventilation etc.), Working environment (workspace, accessibility etc.)
Life (Human)	Man	Staff knowledge, Skills, Physical and mental health of employees etc.

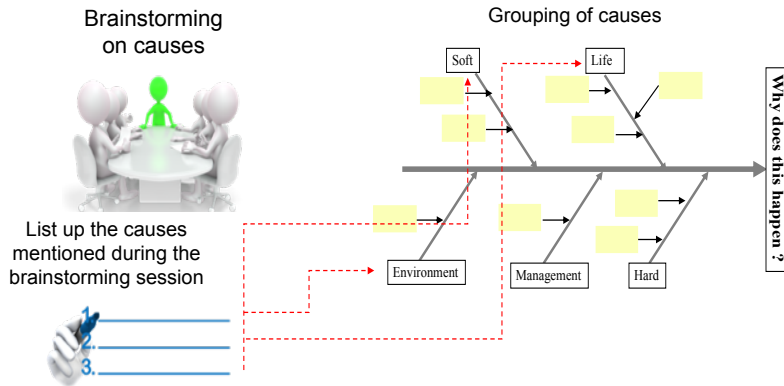


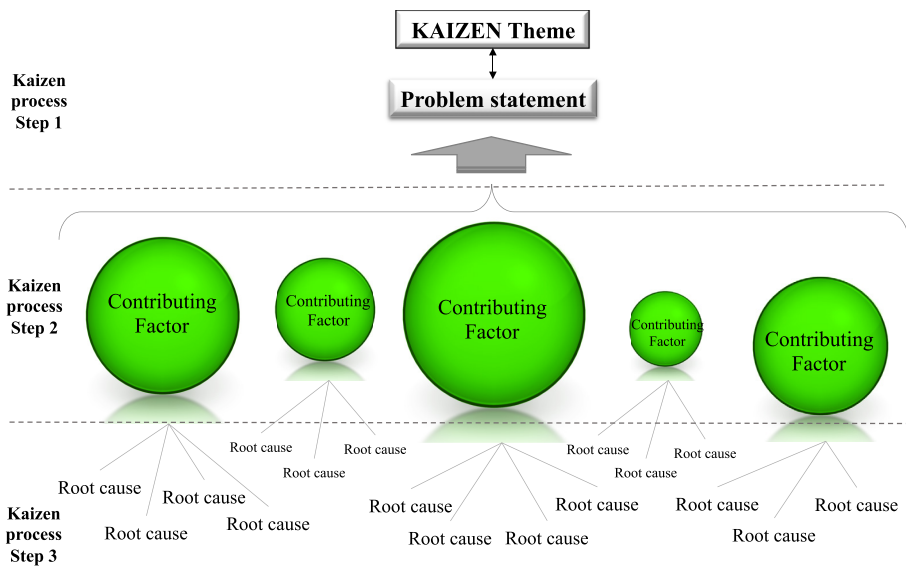
Figure 5-24: Process of grouping of identified causes

- (4) As shown in Figure 4-21, once causes are grouped, each cause will be drilled down. For finding causes, ask “Why it is happening? Because”. Do these five times according to the Five Why Method for each possible cause and extend branches from each possible cause until a clear, finite, single cause per branch is reached. It should not be ambiguous. Finally, circle the identified cause in red; it indicates the root cause. Please note that reasons regarding resource shortages (no funds, no people etc.) are often cited. This obstacle to cause analysis should be avoided.

A free tool for making fishbone diagrams is available on the Internet. Using such tools will make work easier and simpler. See <http://www.vertex42.com/ExcelTemplates/fishbone-diagram.html>

[Relationship among Step 1 to Step 3]

Before going to step 4, let us organise the relationship between steps 1 to 3. The KAIZEN theme is decided according to the situation of each department or section. Usually, these problems are composed of several contributing factors, and the size of the factors varies. Furthermore, each contributing factor has several causes. The basic idea of the KAIZEN approach is not to solve the whole problem immediately but to identify the contributing factors that must be prioritised in Step 2 and to analyse the cause of the identified contributing factors in Step 3. Understanding this relationship will facilitate an understanding of the meaning of all the steps of the KAIZEN method.



"Root causes" are the causes of the "Contributing factors."

Figure 5-25: Relationship among Step1 to Step 3

Step 4: Countermeasures identification

Step 4 contains countermeasures to solve the cause found in Step 3 and verify the possibility of implementing the countermeasure. In this step, one should use the tree diagram, which is one of seven new QC tools, and the matrix diagram used in Step 1. The tree diagram is used for the identification of countermeasures to resolve the cause. The matrix diagram is used to verify the feasibility of the identified countermeasure from various viewpoints.

Identify countermeasures using the tree diagram

- (1) List all the causes found in Step 3 on the left side of the tree diagram.
- (2) Next, consider primary countermeasures against the causes. Usually, the cause is written using negative words and expressions. By phrasing the cause in positive words and expressions, it becomes a primary countermeasure. For example, if there is the cause of handing over meetings are not starting on time, it can be rewritten as handing over and meeting starts on time as a primary countermeasure.
- (3) Next, one should contemplate how to realise primary countermeasures, which is a secondary countermeasure. For example, for morning conferences start on time, we need to take actions like those below, for example:
 - Create a meeting plan within the department
 - Inform key personnel about the agenda, time and venue of the meeting
 - Manage time as per each meeting

(4) If we need to take further detailed actions/secondary countermeasures, we can expand our strategy to tertiary countermeasures. For example, the activity Inform key personnel about the agenda, time and venue of the meeting can be divided into the following activities:

- Establishment of conference secretariat
- Selection of person in charge
- Formulation of Terms of References for the secretariat

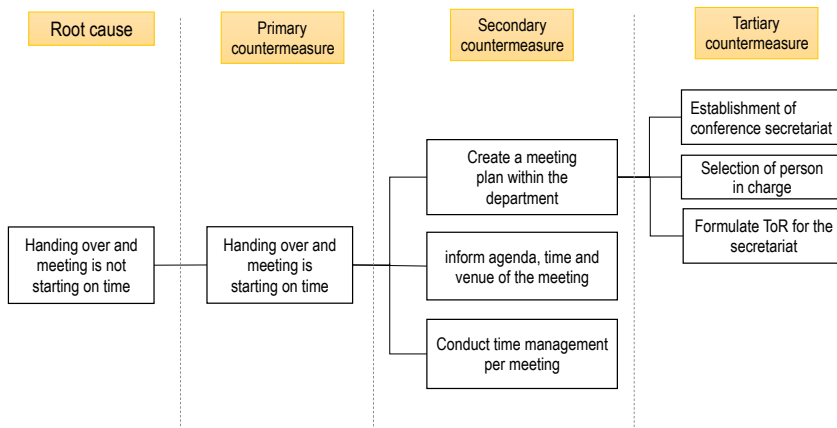


Figure 5-26: Countermeasure identification using a tree diagram

Checking feasibility using Matrix diagram

- (1) Verify the feasibility of each activity identified by the tree diagram from various angles. Generally, importance, urgency, difficulty of implementation, implementation period and availability of necessary resources are used for a feasibility check. However, other check items can be added depending on the activities.
- (2) Regarding the judgment of feasibility, it is necessary to have a scoring scale. Scoring scales are usually set in the following way:
 - 3 = High priority, easy to implement
 - 2 = Medium priority
 - 1 = Low priority, difficult to implement
- (3) Set the cut-off value to judge feasibility. It would be reasonable to set the cut-off value to around 70%. If the cut-off value is too high, many activities cannot be conducted, and it will be meaningless to pursue Kaizen activities. Thus, it is recommended to set 70% as the cut-off value. If the judgment criteria consist of five items, 15 points will be needed for full marks, so 70% of 15 points equals 11 points. Activities that acquire 11 points and above will be implemented.

- (4) When scoring each countermeasure, the relationships among the detailed countermeasures need to be checked properly for avoiding conflicts. For example, if employees building capacity through training is the primary countermeasure, there could be three ways for conducting the training as secondary countermeasures. Those are 1) developing training materials, 2) conducting the training and 3) following up with training. However, if the development of training materials is scored low and conducting the training is scored high, there will be the question: Can you conduct training without materials? To avoid such a discrepancy between countermeasures, please judge the feasibility of not only deciding on single activities but also considering the linkage with other activities.

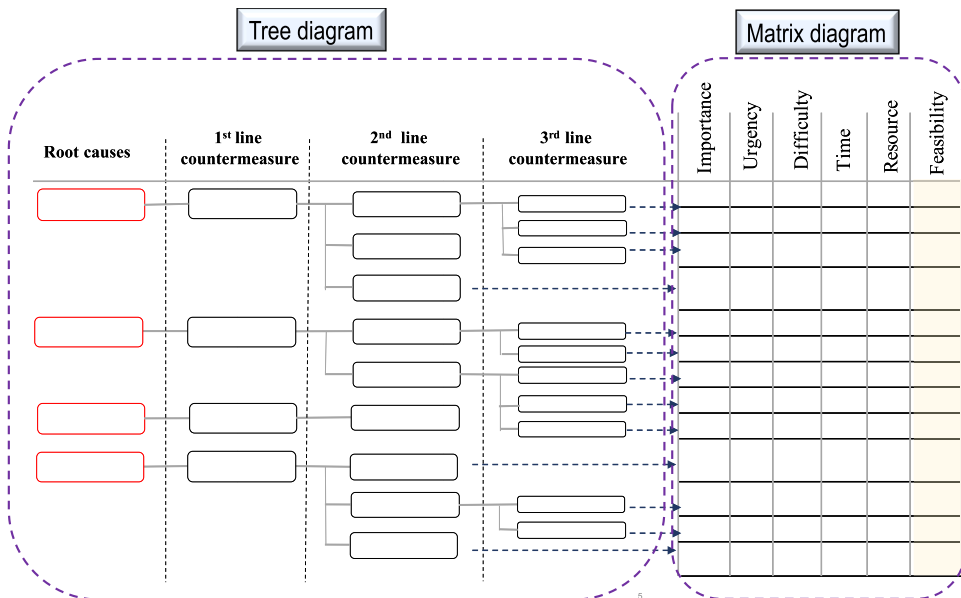


Figure 5-27: Relationship regarding the tree diagram and matrix diagram

Please check this site for free tools: <https://www.smartdraw.com/software/tree-diagram-maker.htm>.

Step 5: Countermeasures implementation

Step 5 is the process of implementing the countermeasures judged feasible in the previous step.

- (1) Formulate an operation plan for implementing feasible countermeasures; check Step 4. It is recommended one use the 5W1H style for formulating the implementation plan. Even if we draw a beautiful plan, it will be meaningless unless it is implemented. Therefore, a style everyone can understand is necessary. The 5W1H style clearly and easily describes who, when, where, what, why and how.

	Explanation	Example
Who	Who is the responsible person?	WIT members
What	What will implemented?	5S activities
Where	Where it will be implemented ?	At nurse station
When	When it will be implemented ?	Daily
Why	Why it need to be implemented ?	For improvement of working environment
How	How it will be implemented ?	By everyone's participation

Figure 5-29: Example of 5W1H

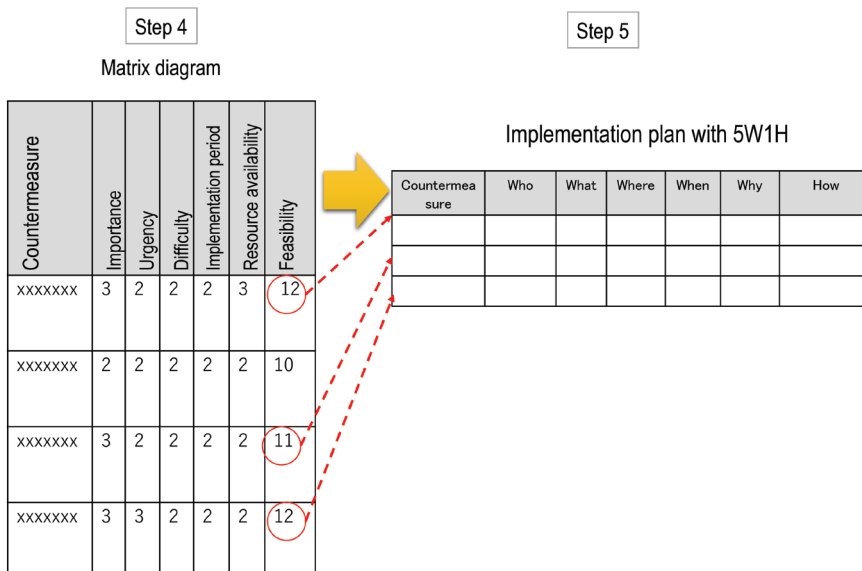


Figure 5-28: How to develop an implementation plan from Step 4

- (2) After preparing the implementation plan, please prepare a progress check sheet so the progress of the implementation of countermeasures can be confirmed. Although it can be prepared separately from the implementation plan, it is recommended that the style be combined with the implementation plan.

#	Countermeasures	WHY	WHO	WHEN	WHERE	WHAT	HOW	Plan for progress monitoring	Date of monitoring	Check by	progress
1							/ /			
								/ /			
2							/ /			
								/ /			
3							/ /			
								/ /			
4							/ /			
								/ /			
5							/ /			
								/ /			

G: Good progress , D: Delay of implementation, C: Completed or Implemented

Figure 5-30: Combine types of implementation plan and progress check

- (3) Carry out the planned activities. Please post the implementation plan and the progress check sheet on the notice board so everyone in the workplace can understand, implement and monitor it. As for the implementation period, it is recommended the implementation period of Step 5 not exceed two months, considering the implementation period (within six months) of all steps.

Step 6: Effectiveness check

This step confirms whether the problem was solved and the situation was improved by the countermeasures taken in the previous step.

Confirm the situation after the Kaizen activity in the same method and the same investigation period as in the current situation analysis conducted in Step 2. Copy the result to the following comparison table. Then, calculate the frequency, cumulative frequency and cumulative percentage, and compare them with the Pareto chart depicting the scenario before and after KAIZEN.

- (1) Please check the effectiveness of improvement activities with this comparison. As a precaution, originally, the maximum frequency in the Pareto chart was set to the maximum value of the frequency scale, but for comparison, it is necessary to adjust the frequency scale of the Pareto chart depicting the post-KAIZEN scenario to the one used before KAIZEN.

SQ#	Contributing factors	Before KAIZEN			After KAIZEN			Reduced frequency	Reduction Ratio
		Frequency	Cumulative frequency	Cumulative (%)	Frequency	Cumulative frequency	Cumulative (%)		
1	Number of case long waiting happened at reception	10	10	46.3	7	7	50	3	30.0
2	Number of case long waiting happened at outside of consultation room	9	19	75.9	4	11	79	5	55.0
3	Number of case long waiting happened at cashier	3	22	88.0	2	13	93	1	33.0
4	Number of case long waiting happened at laboratory	2	24	96.3	1	14	100	1	50.0
5	Number of case long waiting happened at dispensing area	1	25	100	0	15	100	1	100.0
	Total	25	-	-	15	-	-	10	40.0

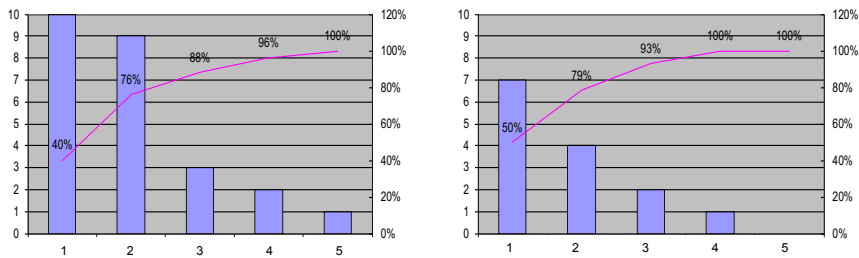


Figure 5-31: Comparison of before KAIZEN and after KAIZEN

- (2) Next, confirm the implementation status and effectiveness of each countermeasure based on the progress confirmation being undertaken and the situation change at the workplace after activities are implemented. Each activity confirmed will sort out whether it matches ① to ④ in the table below. Since the feasibility of the planned activities is checked in Step 4, basically, it is assumed that all are implemented and should be effective. Thus, all of them go in ①. However, in some cases, some activities could be classified as ② to ④, so please consult the implementers fully and judge the effect. Since the verification of this effect greatly affects Step 7, please be sure to perform it.

		Effectiveness	
		Effective	Not effective
Implementation	Countermeasure implemented	① <i>It is effective and need to be standardized</i>	② <i>It is not effective and need to review measures</i>
	Countermeasure not implemented	③ <i>Need to clarity why it is effective</i>	④ <i>Implement some measures (DO something)</i>

Figure 5-32: Effectiveness check table

It is also important to know what kind of effect has appeared. There are three types as follows:

Type of effect	Meanings	Example
Tangible effect	How much the expected effects and characteristic values were improved	○○ is reduced xx%; ○○minutes were shortened etc.
Intangible effect	Effects that appeared besides tangible effects	Teamwork is improved, employee motivation is increased etc.
Ripple effect	Any other influences (can be positive or negative)	The work process of Section A is delayed (negative). Our KAIZEN was adopted by Section B (positive).

Step 7: Standardization

Step 7 aims to continue effective countermeasures verified in the previous step and to maintain good conditions. Therefore, Step 7 standardises the implementation method of countermeasures so everyone in the field will participate and create a mechanism that can continue.

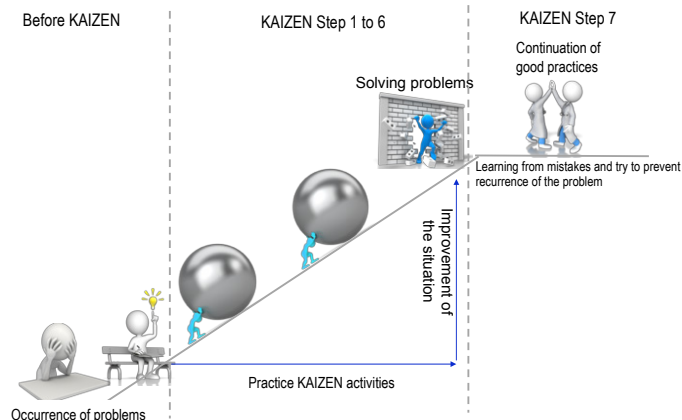


Figure 5-33: Standardization of effective countermeasures

The way to proceed in Step 7 is as follows:

- (1) Identify activities that were implemented and effective, as confirmed in the previous step
- (2) Create a table for a standardisation activity plan and progress management in the style of 5W1H (Fig. 5-34) like the activity implementation plan used in Step 5
- (3) List the activities that were implemented and effective on the far left of the table
- (4) Create plans according to the style of 5W1H while sharing in the workplace and discussing
- (5) Activities will take place according to the plan; monitoring will be conducted periodically

Standardized activities	WHY	WHO	WHEN	WHERE	WHAT	HOW	Progress check	How often to check	Who is going to check
							<input type="checkbox"/> Continue <input type="checkbox"/> Suspended	<input type="checkbox"/> Following regulation <input type="checkbox"/> Not following regulation	
							<input type="checkbox"/> Continue <input type="checkbox"/> Suspended	<input type="checkbox"/> Following regulation <input type="checkbox"/> Not following regulation	

Figure 5-34: Format of standardisation activity plan

Please note the following issues for implementation;

Attention point 1)

Activities such as the preparation of training materials for the capacity building of staff or conducting staff training might be judged as effective in Step 6. However, those activities are usually one-off. Therefore, it is better to change and continue measures like utilization of prepared materials and induction training for new staff and list them in the standardisation activity plan.

Attention point 2)

Who takes part in the plan? It is better to list employees' titles, rather than names.

Attention point 3)

Describe the frequency of activities, for example every day, first week, at the end of the month.




Action plan in Step 5		Standardization plan in Step 7
Develop training materials	→	Utilize developed training materials to train.....
Develop SOPs	→	Utilize developed SOP to sustain.....
Train facilitators.....,	→	Utilize trained facilitators to





Chapter 6: Useful tools for 5S activities





6.1. Use of tools for 5S activities



Tools are identified as useful for strengthening the daily practice of the 5S activities; these are useful for achieving their purposes, such as proper space utilisation, proper communication, mistake proofing, productivity/efficiency, cost-effectiveness and sustainability. The tools listed in the table below are commonly used for 5S activities. When we use the tools, it is necessary to have an agreed set of rules and the rules need to be well known by all staff in the health facility.

Table 6-1: Useful tools for 5S activities

Tools	Descriptions	Image
Alignment	<ul style="list-style-type: none"> This improves the orderliness with which equipment, furniture, items etc. are arranged. It is useful to create space and clarify the workflow, which leads to improved productivity. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Consider the flow of work, space and the arrangement of items 2. Decide the right position to keep items 3. Use lines or tape to clarify alignment 	
Alphabetical coding	<ul style="list-style-type: none"> Alphabetising helps identify files and items. It is useful to improve the search for files and items in a short period, which leads to improved productivity and mistake proofing. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Give an alphabetised identifier to files or items 2. Arrange files or items in proper order according to the given alphabet 3. Place an inventory index of the names with its alphabetical coding 	
Colour coding	<ul style="list-style-type: none"> It is used to visualize categories of items, services, and processes depending on the agreed set of rules It is useful to improve the safety of employees, patients and visitors. For example, it can be utilized for segregation of medical wastes, indication of the purpose of cleaning tools, stock control of health commodities etc. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Decide colours and their meanings according to their purposes 2. Identify proper materials for rendering colours, or get ready-made items with the colours one sets 	

Tools	Descriptions	Image
<p>Labelling</p>	<ul style="list-style-type: none"> • Labelling identifies items and the right place to keep them. • It is useful for reducing the time and energy to look for necessary items, which leads to improved productivity. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Need to fix the proper place for keeping proper items 2. Arrange the items accordingly 3. Develop and affix visible/readable labels 	
<p>Numbering</p>	<ul style="list-style-type: none"> • Numbering helps identify files and items. • It is useful for improving the search for files and items in a short period, which leads to improvements in productivity and mistake proofing. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Give identification numbers to files or items 2. Arrange files or items in proper order according to the given numbers. 	
<p>Red tag</p>	<ul style="list-style-type: none"> • The tag accelerates decisions to sort unnecessary items. • It is useful for removing unnecessary items from the current workflow, which leads to improvements in productivity. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Develop a red tag 2. Fill in the tag with necessary information 3. Put the tag on any item for which we could not make decision whether it is necessary or not 4. Leave it for one month: <ul style="list-style-type: none"> - If the tagged item is used in a month, it is necessary for current work processes. - If it is not used at all, it is unnecessary for current work processes. 	
<p>Safety signs</p>	<ul style="list-style-type: none"> • Safety signs alert employees and facility users to dangerous/hazardous conditions and items. • It is useful to improve the safety of employees, patients and visitors. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Design or import available safety signs for different situations and places 2. Apply safety signs in visible and appropriate places 3. Monitor effectiveness of safety signs 	

Tools	Descriptions	Image
Signboard	<ul style="list-style-type: none"> It guides visitors and employees to get proper directions to where they want to go. It is useful for the improvement of communication with minimum explanation, which leads to improved productivity. <p>[Instructions for use]</p> <ol style="list-style-type: none"> Develop proper signboards with common/ understandable language Identify right (visible and no confusion) places to put signboards 	
Symbols	<ul style="list-style-type: none"> Symbols enhance visual communication so everyone can understand the meaning of something with marks or symbols. It is useful for improving communication with minimum explanation, which leads to the improvement of productivity. <p>[Instructions for use]</p> <ol style="list-style-type: none"> Design or import available marks or symbols for different items or meanings and standardise them for the organisation Display the symbols in visible places 	
Taping	<ul style="list-style-type: none"> Taping improves the arrangement of files and other items. It is useful for identifying necessary items and preventing their return to the wrong place, which improves productivity and mistake proofing. <p>[Instructions for use]</p> <ol style="list-style-type: none"> Arrange books/files/items properly according to your work Draw a connected diagonal line on the spine of books/files/items using marker pens, ribbons, strings etc. (as per the situation) 	
Zoning	<ul style="list-style-type: none"> It is used to identify places to keep/store items. It is useful to improve productivity through shorter times to look for necessary items. <p>[Instructions for use]</p> <ol style="list-style-type: none"> Identify proper location for items based on the flow of work and available space Identify proper materials for drawing zoning lines (water paints, coloured tape etc.) 	

Tools	Descriptions	Image
X-Y axis	<ul style="list-style-type: none"> • The X-Y axis's purpose is arrangement and orderliness to display papers and posters. • It helps manage information on a notice board. • It is useful for managing the different types of information by category, which leads to improved productivity. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Identify the category of information to display on the board 2. Use tape to create space for each information category with the application of the X-Y axis 3. Display necessary information in appropriate spaces by category 4. Display removal instructions on the board 	
5S-KAIZEN corner	<ul style="list-style-type: none"> • It is used for displaying the progress of 5S-KAIZEN activities, posters and other relevant information for sharing necessary information with employees. • It is useful for updating and reminding employees to sustain 5S-KAIZEN activities in the workplace. <p>[Instructions for use]</p> <ol style="list-style-type: none"> 1. Develop a 5S-KAIZEN corner on a notice board 2. Choose appropriate information for the corner 3. Put/display necessary information on the corner according to an X-Y axis 4. Update information in the corner periodically 	

Please note that those tools can be combined to get higher effectiveness.

6.1.1. Ergonomics and tools for 5S

Ergonomics is an applied science concerned with designing and arranging items that people use so people and things interact most efficiently and safely, with reduced physical stress. Ergonomics is also called *biotechnology*, *human engineering* and *human factors*. When 5S tools are applied, the following points should be considered (reducing physical stress) to improve the working environment;

- Flow of work
- Lighting of the room
- Spacing of workplace (arrangement of furniture and equipment)
- Distance between service points,
- Storage of items based on the frequency of use: items that are used frequently, store them at between “elbow and eye height”)



6.2. Visual control

6.2.1. What is “Visual control”?

Visual control displays the operating or progress status of a given operation in an *easy-to-see format*, while *providing instruction and conveying information*. The purpose of visual control is to increase the efficiency and effectiveness of work, promoting an error-proof environment to augment easy adherence to standards.

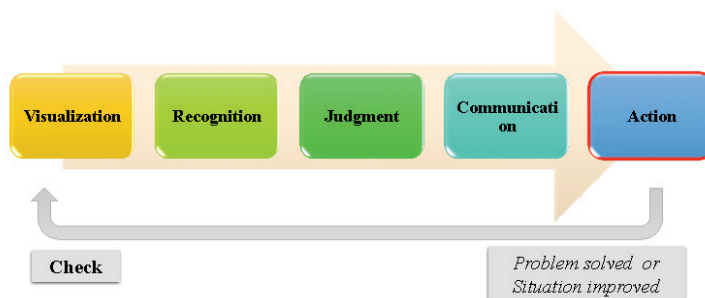
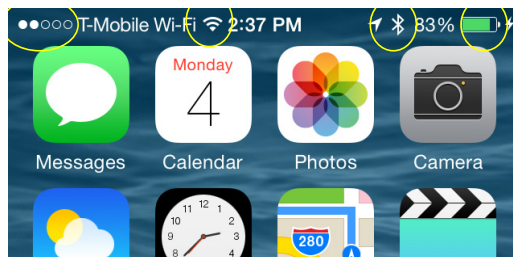


Figure 6-1: Mechanism of Visual control method

Visual control is close to our daily life; tools for 5S are often used. A traffic light is a typical example of visual control. The public well understands the meaning of lights' colours. Drivers and pedestrians follow the traffic light and take necessary action without inquiring about the meaning of the lights. Another example is a mobile phone. Just by looking at a display, it is easy to understand battery conduction, the mobile network's condition, the Wi-Fi connection and other necessary information. Finding a status immediately by merely looking at symbols, signs or colours, and taking necessary action constitute the mechanism of visual control, as depicted below.



6.2.2. How Visual control works in health facility?









1) Example of visual control by colour coding to improve stock management

- Easy to understand the stock level of commodities by colour code
- Possible to improve cost and productivity by preventing overstocking and stock-out
- Before applying visual control conduct situational analysis to identify consumption rate. People often make mistakes that applying colours reflects the meaning of visual control without considering the purposes. When applying visual control make sure items are visible and FEFO FIFO principles





Enough stock	Enough stock
Warning to getting less stock	Warning to getting less stock
Need to refill the medicine immediately	Need to refill the commodities immediately

2) Example of visual control by color coding for improvement of safety

<ul style="list-style-type: none"> Easy-to-understand categories according to their purpose to ensure safety, such as the prevention of cross-infections and the proper handling of healthcare waste management (proper IPC practices) 	
	
 For general use	 For non-infectious waste
 For cleaning of dirty materials	 For infectious waste
 For cleaning of infected materials	 For highly infectious waste

3) Example of visual control for traffic control by symbols and safety signs

<ul style="list-style-type: none"> Easy to communicate just by looking at signs and symbols. In this example, people's movements can be controlled without their permission. 	
	

6.2.3. Useful concept for 5S activities

1) Three F (3F)

Here, 3F stands for “*Fixed place, Fixed numbers and Fixed items*”. This is important for applying the *can see, can take out, can return* philosophy. It is used for the proper inventory of commodities and organising tools and equipment, which is often applied for setting activities in 5S activities. Moreover, 3F can be practised with 5S tools, such as alignment, zoning, labelling and colour coding.

2) First in First Out (FIFO)

FIFO is an inventory management system in which the first or oldest stock is used first and the stock or inventory that has most recently been produced or received is only used

or shipped until all previous inventory in the warehouse or storage has been used or shipped. This ensures that the oldest stock is used first and reduces the costs of obsolete inventory. It is also considered the ideal stock rotation system. This inventory system is commonly used in many industries and is sometimes combined with other warehouses.²³



Figure 6-2: Visual control with colour coding for stock management using FIFO

3) First Expired First Out (FEFO)

This is a simple, highly versatile management method or way of organising, handling and prioritising the moving of primarily material or other commodities. Material requirements are serviced in the order of items with earlier dates of consumption, regardless of the date of entry or acquisition. The term *FEFO* is most often used in logistics and transportation, warehouse management, inventory flow management and production logistics.²⁴

6.2.4. Two-bin inventory control system for Just in Time (JIT)

The just in time (JIT) concept is a management strategy that was conceptualised in the Toyota Production System for Toyota Motor Company. JIT aligns raw-material (commodities and medicine in the health sector) orders from suppliers (hospital main storage area) directly with production and service provision schedules.

Institutions use this inventory strategy to increase efficiency and decrease waste by receiving goods only as they need them for the production or service provision process, which reduces inventory costs. To apply the JIT strategy in the field, the two-bin inventory control system is one of the useful methodologies for the quantity control of raw materials/commodities to help minimise costs.

²³ <http://www.leanmanufacture.net/operations/fifo.aspx>

How to apply the two-bin inventory control system

This system is composed of two bins that start full of components or materials. As production commences, materials are drawn from one bin, and the other bin, which is still full, acts as the buffer or safety stock.²⁵

- 1) Decide the items to be put in a bin and each necessary number based on workload. Develop the list.
- 2) Place items into bin 1 according to the list developed in step 1.
- 3) Place items into bin 2 according to the list developed in step 1.
- 4) Start using the items from bin 1, and when bin 1 becomes empty, pull bin 1 out from the shelf. Start using the items in bin 2.
- 5) While using bin 2, refill bin 1 with the listed items, and place it behind bin 2.
- 6) Continue this cycle to avoid the stock out of necessary items.

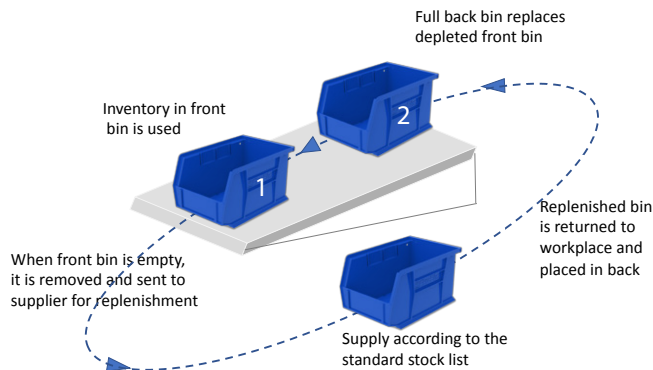


Figure 6-3: Visual control with two-bin system applying the JIT concept

6.2.5. Benefits of using visual control in the workplace

The following points are the benefits of using visual control in the workplace

- Make problems visible to everyone so that corrective action can be taken immediately
- Display the operating or progress status in an easy-to-see format
- Save time for searching something, somewhere
- Manage items/materials/stock easily so that to reduce taking inventory
- Obtain a common understanding of rules and regulations

Important!

People often make a mistake on application of three colors (green, yellow and red) as “Visual control”. It is important to understand the actual meaning of “Visual control”. Easiest way to explain the “Visual control” is ***Just looking at and understand that current situation or condition of something.*** Thus, think what do you want to control and how you want to control the situation with color coding, symbols, numbers etc.

²⁵ <http://www.leanmanufacture.net/operations/twobininventory.aspx>

Chapter 7: M& E of 5S-KAIZEN-TQM activities

7.1. Introduction

Monitoring and evaluation (M&E) is an integral component of quality improvement in health services. Ministry of Health & Medical services staff at all levels and all health facilities including affiliated organizations must understand the basics of M&E including data collection, processing, analysis and use. Knowledge of M&E helps health workers in the health sector to effectively monitor and evaluate their health facilities or programme as well as strengthening their performance. Accordingly, this chapter aims to highlight the M&E components for the implementation of 5S-KAIZEN-TQM as the foundation of all other QI approaches in the country.

7.2. What is Monitoring and Evaluation?

Monitoring and evaluation can be defined as follows;

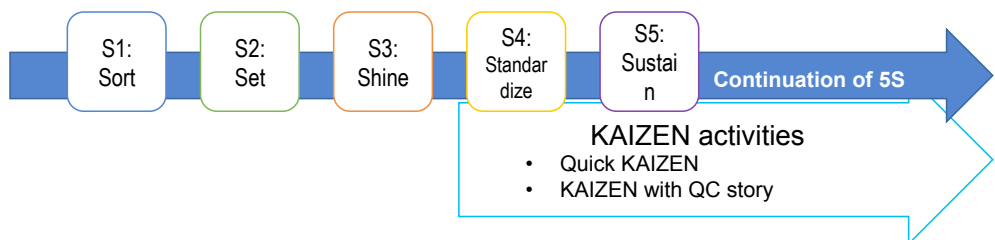
(a) Monitoring

- (i) *Monitoring* refers to the progress tracking of the planned tasks and its implementation in a health facility or programme. Data is systematically collected, analysed and used to provide information to health managers for use in planning and management.
- (ii) *Monitoring* aims to provide regular feedback and oversight of the implementation of activities in relation to plans, resources, infrastructure and the use of services by the community served.

(b) Evaluation

Evaluation represents a set of procedures and analytical tools to examine how health interventions or programmes are implemented, their level of performance and whether they have the intended impact. Evaluation helps to assess the effectiveness, relevance and impact of a health intervention/programme towards the achievement of the set goals.

The process of monitoring and evaluation is summarized in figure 7-1.



improve the workplace environment, and then making effort to provide high-quality safe medical services.

Figure 7-1: M&E process

7.3. Why M&E is needed?

M&E is crucial to QI programmes/approaches, particularly because it:

- Assists directors, health/program managers, in-charges, employees and others in the health sector to perform the daily management of health facilities and programmes.
- Provides information for strategic planning, design and implementation of health interventions and programmes.
- Assists in making informed decisions on the prudent(wise) use of the little resources available.
- Helps to improve performance by identifying those aspects that are working according to plan, and those aspects which need a mid-course correction.
- Tracks changes in services provided and the desired outcomes.
- Helps improve a safe working environment contributing to good health
- Strengthen the system for transparency and accountability.

7.4. Type of M&E activities in the health facility for 5S-KAIZEN-TQM

Three types of M&E activities can be conducted in a health facility, as follows:

7.4.1. Self-monitoring

Self-monitoring needs to be conducted daily to monitor the quality and performance of daily work in sections and departments. It usually occurs with WIT initiative and needs to be known by all members of the department/section and shared to QIT.

7.4.2. Internal M&E activities

Internal M&E activities are conducted by the health facility's management and quality improvement team. They are done periodically (quarterly to twice a year) and evaluate the achievements of activities and the performance of sections and departments in the health facility. The results will be shared (feedback) with sections and departments for departmental optimisation.

7.4.3. External M&E activities

External M&E activities are conducted by third parties with specific expertise. These occur periodically (once or twice a year) and evaluate the achievements of activities and performance at health facilities. The results will be shared (feedback) with HMT and QIT, and it is helpful for improving health services and performance.

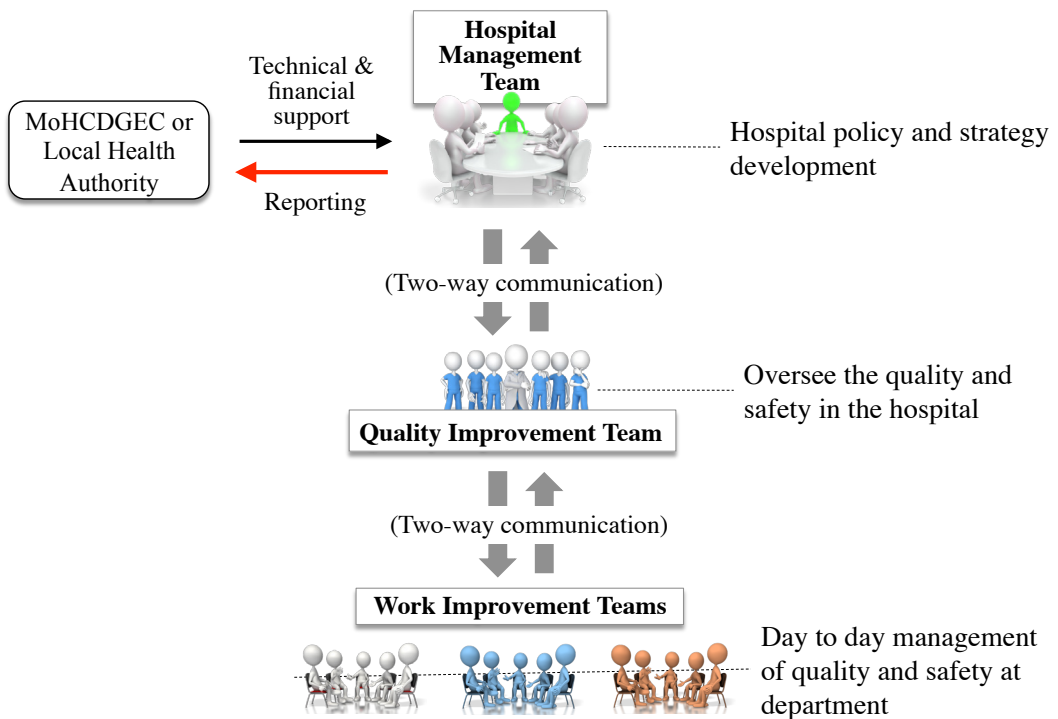


Figure 7-2: Structure of M&E activities in the facility

7.5. How M&E for 5S-KAIZEN-TQM activities are conducted at different levels

7.5.1. National level

Consultation visit to national, zonal referral and specialized hospitals will be carried out by Health Quality Assurance Unit and Department of Curative Services (DCS) of MoHCDGEC. Muhimbili National Hospital, Mbeya Zonal Referral Hospital, Bugando Medical Center and Kilimanjaro Christian Medical Center are the model facilities of 5S-KAIZEN-TQM approach, and need to sustain 5S-KAIZEN activities as training centers of 5S-KAIZEN-TQM approach. Therefore, Consultation visit should be carried out bi-annually to the national level.

7.5.2. Regional level

Based on the movement of alignment with existing mechanism, M&E of 5S-KAIZEN-TQM activities will be incorporated in Internal Supportive Supervision (ISS) and External Hospital Performance Assessment (EHPA). ISS will be conducted by Regional Referral

Hospital Management Team (RRHMT) while EHPA will be conducted by MoHCDGEC in collaboration with RHMT annually. RHMT is conducting Regional Management Supportive Supervision to RRH (RMSS-H) on quarterly basis. Additionally, when RHMT is conducting Regional Management Supportive Supervision to council (RMSS-C) on quarterly basis, consultation visit to district hospitals must be included as a sampling of health facility.

Report of 5S-KAIZEN activities at RRH must be attached with Comprehensive Hospital Operation Plan (CHOP) Quarterly Progress Report and submitted to Coordinator of RRH (in DCS) and sharing with Coordinator of Regional Health Services (DPP) at MoHCDGEC. The report is also copied to RHMT.

7.5.3. District level

As mentioned in 7.5.2., Consultation visit to district health facilities will be carried out by Council Health Management Team (CHMT). CHMT is conducting regular supporting supervision to the primary healthcare facilities on quarterly bases. Report on 5S-KAIZEN activities at primary healthcare facilities must be attached with Comprehensive Council Health Plan (CCHP) Quarterly Progress Report

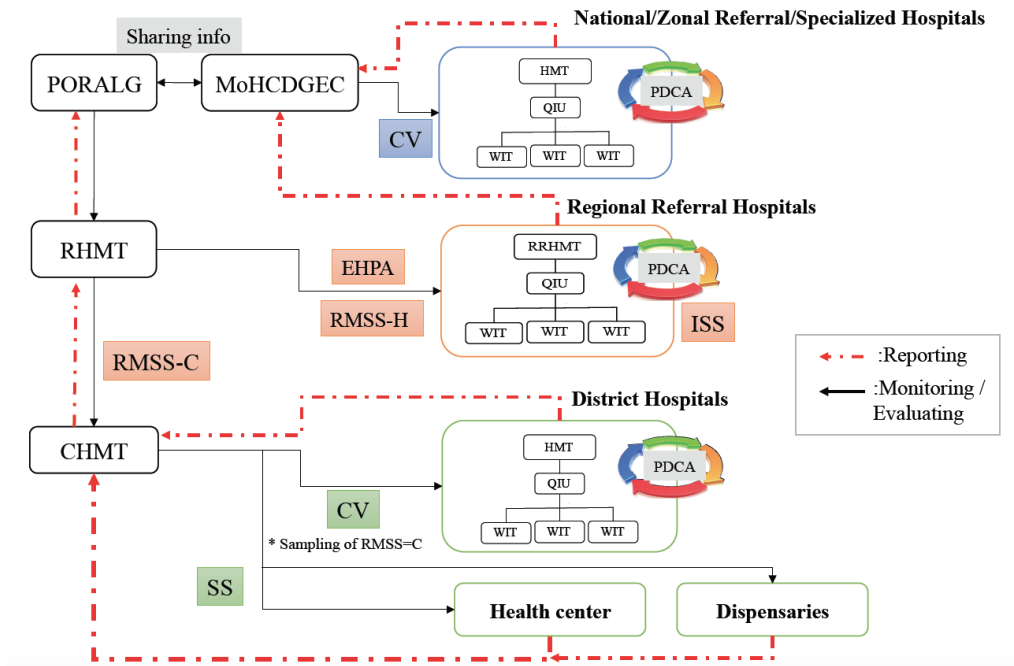


Figure 7-3 Flow chart of M&E activities

7.6. Tools for M&E of 5S-KAIZEN-TQM activities

There are several tools developed for monitoring and evaluation of 5S-KAIZEN-TQM activities as listed in the table below. ISS and EHPA checklist is developed for performance management of RRHs in the country. There are several items included in the checklist to assess the status of 5S-KAIZEN-TQM activities in RRHs. Other tools can be applied in any level of health facilities.

Table 7-1: Available M&E tools

M&E tools	Frequency to use	Used by
5S-KAIZEN M&E sheet	Twice a year by external Quarterly by internal	External and internal assessor
QIT/QIU function check sheet	Twice a year by external Quarterly by internal	External and internal assessor
KAIZEN Progress check sheet	Twice a year by external Quarterly by internal	External and internal assessor
KAIZEN Supportive Supervision checklist	Depending on the number of KAIZEN cases	Internal assessor, Implementors
ISS check list	Quarterly	RRHMTs and QIT/QIU in RRH
EHPA check list	Once a year	EHPA assessor to RRHs

7.7. Recognition and Competitions

“Recognition” and “Competition” are important components for sustainability and continuous improvement of 5S-KAIZEN-TQM activities.

People often confuse between “Recognition” and “Competition”. They are two different issues. “Recognition” is a process which is continuously implemented to recognize achievement for certain level of performance and maintenance of the condition. However, “Competition” is measuring level of performance among teams, groups or individuals, and ranking of competitors by grade of benefits achieved. Aims of introducing “Recognition” scheme into health facility are to increase; motivation of health workers to continue good practices, increase productivity and safety, improve dialogue between management and health workers, reactivate professionalism, strengthen teamwork and so on. On the other hand, aims of introducing “Competition” scheme into health facility are; energizing health workers, increase performance, enhancing creativity to come up with innovative ideas, cultivate ownership and leadership and so on. However, the benefits obtained in introducing recognition and competition schemes often overlap and tend to enhance one another. The difference between these two schemes are;

- No ranking in “Recognition” schemes. Team or individual achieves certain level of performance and maintained the performance in a certain period will be recognized based on set criteria and standards.

- There is ranking in “Competition” scheme. Competitors will be judged by their performance based on criteria, and ranked with alphabet, symbols or numbers according to their performance. Whoever gets highest score will be considered as “Best performer”

7.7.1. Implementation of recognition and competition scheme at health facility

In actual implementation of the two schemes at health facility level, it is recommended to use “Recognition” scheme first to rollout 5S activities efficiently and effectively, especially for strengthening S4 and S5 activities and beginning of KAIZEN implementation. Then, when the KAIZEN processes are known and used by health workers, introduction of “Competition” scheme will be more effective.

Team approach and individual approach can be applied for both “Recognition” scheme and “Competition” scheme. For example, a team that shows high performance is rewarded, and also among the team, staff who contributed most receives award individually or every one of the team members, get small gift.

Criteria used for “Recognition” and “Competition” should be separated. After development of criteria for both schemes, criteria must be shared with all staff working in your health facility. Results of contest or verification are also opened to all staff. This will ensure judicious judgment and reduce envy of team awarded or rewarded. Internal monitoring and evaluation results, number of KAIZEN suggestions and its implementation, request for internal verification can also be used for both “Competition” and “Recognition” schemes. Management of health facility should develop criteria for “Competition” or “Recognition” at health facility. Additionally, awards for “Completion” and rewards for “Recognition” should be decided based on resource availability and sustainability.

7.7.2. Implementation of recognition and competition scheme at national level

MoHCDGEC through the unit responsible for coordination of QIPs, in collaboration with other stakeholders, will develop its mechanism to recognize health facilities. Also, once a year, completion of the health facilities will be organized by categories of services: (i) National, Zonal Referral, and Specialized hospitals (ii) Regional Referral Hospitals; (iii) District Hospitals; and (iv) Private Hospitals. Results will be shared and award will be provided to the top three health facilities in each category.

Annex 1: 5S-KAIZEN Monitoring & Evaluation sheet

5S-KAIZEN Monitoring and Evaluation Sheet

Name of evaluator		Name of Section visited	#1.
			#2.
			#3.
			#4.
			#5.

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
Leadership	1	Ask/observe about knowledge and awareness on 5S-KAIZEN-TQM Approach among managers and the staff	<ol style="list-style-type: none"> Not aware of 5S-KAIZEN activity Aware of 5S activities but not able to explain about 5S-KAIZEN activities accordingly Able to explain about 5S-KAIZEN activities accordingly but not able to explain its purposes Able to explain about 5S-KAIZEN with its purposes Able to explain the purpose of 5S-KAIZEN activity with evidence of their willingness to practice 					
	2	Ask/observe about in-charge of department/section fosters/promotes the implementation of 5S-KAIZEN activities in department/section	<ol style="list-style-type: none"> No departmental/sectional orientation program on 5S-KAIZEN for staff Departmental/sectional orientation program on 5S-KAIZEN for staff with no evidences/ records Departmental/sectional orientation program on 5S-KAIZEN for staff with the evidence/ records The in-charge organizes 5S-KAIZEN activities in the department/section and its records are well managed The in-charge negotiates with QIT or upper management/committee to obtain any resources for implementation of 5S-KAIZEN activities, with evidences 					
Sort	3	Ask/observe about items are categorized according to sorting categories, and unnecessary items removed from working place (including walls, notice boards, drawers, cabinets and shelves etc.) with an inventory	<ol style="list-style-type: none"> No sorting activities done Items are categorized but unnecessary items remain in the section/department Item are categorized, unnecessary items removed and dumped in the hospital yard Unnecessary items are sent to “unnecessary item store” without inventory Unnecessary items are sent to “unnecessary item store” with inventory 					

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
	4	Ask/observe about storage/place for keeping unnecessary items at section, and unnecessary items are grouped accordingly	<ol style="list-style-type: none"> 1. The storage/place not identified 2. The storage/place identified but unnecessary items not kept in the storage/place 3. Unnecessary items kept in the storage/place but not grouped accordingly 4. Unnecessary items kept in the storage/place grouped accordingly or returned to main store/workshop with no inventory 5. Unnecessary items kept in the storage/place grouped accordingly or returned to main store/workshop with an inventory 					
Set	5	Ask/observe about arrangement of necessary items with consideration of work efficiency, mistake proofing and safety by applying several important philosophies: <ul style="list-style-type: none"> - “Can see, can take out and Can return” - 3F (Fixed items, Fixed place, Fixed numbers) principle - FEFO (First Expire, First Out) - FIFO (First In, First Out) 	<ol style="list-style-type: none"> 1. No consideration of work efficiency in arrangement of necessary items 2. Arrangement of necessary items with consideration of only beautification 3. Arrangement of necessary items with consideration of only work efficiency 4. Arrangement of necessary items with consideration of work efficiency and mistake proofing 5. Arrangement of necessary items with consideration of work efficiency, mistake proofing and safety 					
	6	Ask/observe about knowledge on effective use of “Tools for 5S” and “Visual Control Method” , and its utilization <ul style="list-style-type: none"> - Tools for 5S; Labels, Zoning, X-Y Axis, Taping, Color Coding, Numbering, Al-phabetical code, Safety sign etc. 	<ol style="list-style-type: none"> 1. No application of Tools for 5S 2. Knowledge on Tools for 5S among the staff but no application of the tools 3. Tools for 5S applied but not effectively used 4. Tools for 5S applied effectively but agreed set of rules for the tools’ usage are not set and shared with all the staff 5. Tools for 5S applied effectively and agreed set of rules for the tools’ usage shared with all the staff 					
Shine	7	Observe and ask about cleanliness and tidiness of all workplace including toilets, sluice room, changing room etc.	<ol style="list-style-type: none"> 1. No cleanliness and tidiness in most of areas 2. Cleanliness and tidiness observed in few areas 3. Cleanliness and tidiness observed in most of areas 4. Cleanliness and tidiness observed in all the areas 5. Cleanliness and tidiness observed in most of areas, and cleaning schedule is displayed 					

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
Standardize	8	Ask/observe about waste management strategy is implemented according to the National IPC Standards	<ol style="list-style-type: none"> 1. No basic knowledge on proper waste management among staff 2. Insufficient knowledge on proper waste management observed among the staff and poor waste management observed 3. Basic knowledge on proper waste management observed among the staff but poor waste management observed 4. Waste management implemented based on the own standards 5. Waste management implemented properly according to the National IPC Standards 					
	9	Ask/observe about maintenance for machines, equipment, tools and furniture and in working order	<ol style="list-style-type: none"> 1. Most of machines/equipment/tools/furniture not functioning 2. Few machines/equipment/tools/furniture not functioning 3. Machines/equipment/tools/furniture well maintained and functioning by observation 4. Machines/equipment/tools/furniture well maintained with maintenance records but no PPM 5. Machines/equipment/tools/furniture well maintained with maintenance records and PPM in place 					
	10	Ask/observe about standardized checklist for monitoring S1-S3 activities and its utilization at the department/section	<ol style="list-style-type: none"> 1. No standardized checklist for monitoring S1 to S3 activities 2. Standardized checklist developed but not used 3. Standardized checklist used irregularly 4. Standardized checklist used regularly but its result not shared with everyone at the department/section 5. Standardized checklist used regularly and its result well shared with everyone at the department/section 					
	11	Ask/observe about in-house rules for implementation of S1-S3 activities are developed and shared by everyone at the department/section	<ol style="list-style-type: none"> 1. The rules for S1-S3 activities not developed 2. The rules for S1-S3 activities partially developed 3. The rules for S1-S3 activities fully developed but not followed 4. The rules for S1-S3 activities fully developed and followed but not shared with everyone 5. The rules for S1-S3 activities fully developed, followed and shared evidenced by observation 					

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
	12	Ask/observe, use of SOP, an instruction and any other useful tools for staff to continue appropriate implementation of S1-S3 activities	<ol style="list-style-type: none"> 1. No SOP, an instruction and any other useful tools for continuing S1-S3 activities 2. Some SOP, an instruction and any other useful tools developed but not applied/practiced 3. Some SOP, an instruction and any other useful tools applied/practiced 4. All necessary SOP, an instruction and any other useful tools developed but not applied/practiced 5. All necessary SOP, an instruction and any other useful tools applied/practiced 					
	13	Ask/observe about disposal and maintenance procedure/mechanism is in place and followed	<ol style="list-style-type: none"> 1. No existing disposal and maintenance procedure/mechanism 2. Disposal and maintenance procedure/mechanism on the process of development 3. Disposal and maintenance procedure/mechanism in place but not followed 4. Disposal and maintenance procedure/mechanism followed but not properly recorded 5. Disposal and maintenance procedure/mechanism followed and well recorded 					
Sustain	14	Ask/observe about any mechanism for motivating the staff in implementation of 5S-KAIZEN activities in place (e.g. achievement award, recognition events appreciation methods at section level etc.)	<ol style="list-style-type: none"> 1. No mechanism for staff motivation 2. Mechanism for staff motivation in place but not implemented 3. Mechanism for staff motivation irregularly implemented 4. Mechanism for staff motivation regularly implemented but not documented 5. Mechanism for staff motivation regularly implemented and well documented 					
	15	Ask/observe about photographic evidences of before and after 5S implementation are in place	<ol style="list-style-type: none"> 1. No photographic evidences 2. Photographic evidences kept by QIT hence difficult to compare the situation before and after 5S-KAIZEN activities 3. Photographic evidences displayed in the department/section but not-periodically updated 4. Photographic evidences displayed in the department/section and periodically updated but no descriptions on the pictures 5. Photographic evidences displayed in the department/section and periodically updated and clear descriptions on the pictures 					

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
Productivity	16	Ask/observe about identification and proper utilization of health resources (i.e. HRH, finance, commodities and equipment) by using 5S-KAIZEN-TQM Approach	<ol style="list-style-type: none"> Necessary health resources not identified Necessary health resources identified but not effectively utilized Partial utilization of the health resources Effective utilization of the health resources but no evidence Effective utilization of the health resources with evidences 					
	17	Ask/observe about reviewing the processes and health service delivery , and adopt new ideas to improve productivity of the section/ department	<ol style="list-style-type: none"> No consideration of reviewing processes Reviewing process done but no action taken Reviewing process done and actions taken but no evidence Reviewing process done and actions taken with evidences Processes reviewed with Value Stream Mapping and improved for improving productivity 					
	18	Ask/observe about effective utilization of 5S-KAIZEN-TQM Approach to increase productivity of the department/section	<ol style="list-style-type: none"> No application of 5S-KAIZEN activities 5S-KAIZEN activities practiced without consideration of improving productivity Only some Tools for 5S applied for improving productivity Visual Control Method well applied for improving productivity but not followed by the staff Visual Control Method well applied for improving productivity and well followed by the staff 					
Quality	19	Ask/observe about documentation and utilization of the data and information to improve the quality of service	<ol style="list-style-type: none"> Information not shared at all, and no plan to share and disseminate information to the subordinate Plan to share and disseminate information to the subordinate in place but not followed Plan to share and disseminate information to the subordinate followed irregularly Plan to share and disseminate information to the subordinate followed irregularly but no plan for external customers Good mechanism to share and disseminate information to both internal and external client followed well (information well delivered) 					

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
	20	Ask/observe about fewer rejects and fewer wastage (MURI, MURA, MUDA), through 5S-KAIZEN process <i>*Definition of MURI, MURA and MURA: Refer to "Implementation Guideline for 5S-KAIZEN-TQM Approaches"</i>	<ol style="list-style-type: none"> 1. No evidence to reduce waste or rework (ex. no Visual Control Method applied for stock management and no standardize checklist) 2. Evidence to reduce waste and rework in place and Visual Control Method applied, but not clearly understood by staffs 3. Evidence to reduce waste and rework in place and Visual Control Method well applied, but standardized checklist not in place 4. Evidence to reduce waste and rework in place and Visual Control Method well applied, but standardized checklist not regularly used 5. Evidence to reduce waste/rework through 5S-KAIZEN well applied i.e. visual control, checklist present and regularly used 					
	21	Ask/observe about the concepts of health and non-health expectations is considered to provide quality services	<ol style="list-style-type: none"> 1. The staff not understand the concept of 5S-KAIZEN in relating to Quality Improvement 2. The staff not considering use of the concept of 5S-KAIZEN to improve quality services 3. The staff understand the concept of 5S-KAIZEN in relating to Quality Improvement but not implement 4. The staff implemented 5S-KAIZEN activities with consideration of relation to Quality Improvement but no record of its implementation 5. Staff have concept of 5S-KAIZEN activities appropriately considering quality of services i.e work flow, waiting time reduction, clean ward facility and appropriate consultation time and respect for person. 					
Cost	22	Ask/observe about cost consciousness and actions taken to reduce/save cost of materials, resource, work-labor, administrative procedure and lowering of defects by introducing the concept of 5S-KAIZEN-TQM Approach	<ol style="list-style-type: none"> 1. No cost consciousness observed among the staff (i.e. waste of time, energy, unnecessary movement, electricity, and water etc.) 2. Cost consciousness observed but no measure taken to reduce/save cost on waste of time, energy, water and unnecessary movement. 3. Actions taken to reduce/save at least electricity and water but no actions taken to reduce/save cost on waste of time, energy and unnecessary movement. 4. Awareness measures are applied but not standardized. 5. Awareness measures are applied, standardized and its evidences of cost reduction is observed. 					

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
	23	Ask/observe about “ Just in Time ” concept is applied for inventory management	<ol style="list-style-type: none"> 1. No evidence of lowering inventory cost, organization of the store, proper labeling, inventory list, regular control of stocks 2. Two (2) of the above are applied with evidence 3. Three (3) of the above are applied with evidence 4. Four (4) of the above are applied with evidence 5. All the above are applied with evidence 					
Safety	24	Ask/observe about safety measures to reduce/prevent incidents (near-miss), accidents and medical errors are in place and disseminated	<ol style="list-style-type: none"> 1. No report book to report incidents/accidents/errors and no awareness on importance of reporting incidents/accident/errors among the staff 2. The report book in place but not recorded 3. The report book in place and few incidents/accidents/errors recorded, but not reported to the higher authority 4. The report book in place and few incidents/accidents/errors recorded, and reported occasionally to the higher authority 5. The report book in place and all incidents/accidents/errors recorded, and reported periodically to the higher authority 					
	25	Ask/observe about availability of the safety gears, vaccines and PPE to protect the internal and external clients	<ol style="list-style-type: none"> 1. Staff are not aware of importance of safety measures, no SOPs, symbols and PPE for safety measures 2. Awareness of importance of safety measures among the staff but no safety measures in place 3. Some safety measures in place 4. SOPs, symbols and PPE in place but not adhered 5. SOPs, symbols and PPE well adhered 					
	26	Ask/observe about knowledge and skills on evaluation protocols (evacuation procedure, fire extinguisher and evaluation routes etc.) of the staff and its proper utilization for internal and external clients	<ol style="list-style-type: none"> 1. No awareness on evacuation protocols observed among staff 2. Awareness on importance of evacuation protocols observed among staff but no basic knowledge and skills for following the protocols 3. Basic knowledge and skills for following evacuation protocols observed but no training on proper evacuation conducted 4. Basic knowledge and skills for following evacuation protocols observed and training on proper evacuation conducted with evidences, but no instruction prepared for external customers 5. Basic knowledge and skills for following evacuation protocols observed and training on proper evacuation conducted with evidences, and instructions for external customers in place 					

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
Delivery of services	27	Ask/observe about staffs' commitment and competency to deliver services in time	<ol style="list-style-type: none"> 1. No evidence of services and products provided according to instruction/guidelines 2. Mechanism to provide services and product according to instruction/guidelines are in place but not followed. 3. Mechanism to provide services and product according to instruction/guidelines are in place and occasionally followed 4. Mechanism to provide services and product according to instruction/guidelines are in place and followed but there is no monitoring. 5. Mechanism to provide services and product according to instruction/guidelines are in place and followed and monitored. 					
	28	Ask/observe about a mechanism to monitor time of delivery of the services in the department/section	<ol style="list-style-type: none"> 1. There is no mechanism to reduce delivery time. 2. There is evidence of mechanism to reduce delivery time but not followed. 3. Mechanism is in place and occasionally followed. 4. Mechanism is in place and is followed but not monitored. 5. There is evidence of mechanism to reduce delivery time which is followed and monitored. 					
Morale	29	Ask/observe about 5S-KAIZEN mindset for TQM culture is raised within the department/section	<ol style="list-style-type: none"> 1. No KAIZEN suggestions/ideas raised by staff to solve gaps identified in ISS, EHPA and any other M&E during sectional meetings. 2. KAIZEN suggestions/ideas raised for less than half of the gap identified during ISS, EHPA and any other M&E but no action taken. 3. KAIZEN suggestions/ideas raised for more than half of the gap identified during ISS, EHPA and any other M&E, and action taken but no documentation. 4. KAIZEN suggestions/ideas raised for more than half of the gap identified during ISS, EHPA and any other M&E, and action taken with documentation but not standardized and sustainability mechanism 5. KAIZEN suggestions/ideas raised for more than half of the gap identified during ISS, EHPA and any other M&E, and action taken with documentation, sustainability mechanism in place and monitored 					

Categories	Q#	Description	Marking criteria	Section visited				
				#1	#2	#3	#4	#5
WIT function	30	Ask/observe about responsibilities of WIT are carried out according to the plan	<ol style="list-style-type: none"> 1. No clear roles and responsibilities of WIT 2. Roles and responsibilities of WIT developed but not well known by WIT members 3. Roles and responsibilities of WIT known by all WIT members but not well followed 4. Roles and responsibilities of WIT well followed by all WIT members 5. WIT performing well and implement their tasks according to the plan 					
	31	Ask/observe about regular WIT Progress Report of 5S-KAIZEN activities to QIU/QIT with evidences, and availability of QIU/QIT inputs such as comments, suggestions and recommendations	<ol style="list-style-type: none"> 1. The progress of 5S-KAIZEN recorded and not reported to QIU/QIT 2. The progress of 5S-KAIZEN partially recorded but not reported to QIU/QIT 3. The progress of 5S-KAIZEN partially recorded and occasionally reported to QIU/QIT 4. The progress of 5S-KAIZEN fully recorded but occasionally reported to QIU/QIT 5. The progress of 5S-KAIZEN fully recorded and regularly reported to QIU/QIT 					
	32	Ask/observe about regular self-monitoring of KAIZEN activities by WIT with evidences, and availability of QIU/QIT inputs such as comments, suggestions and recommendations	<ol style="list-style-type: none"> 1. Self-monitoring checklist for KAIZEN not developed 2. Self-monitoring checklist for KAIZEN developed but not used 3. Self-monitoring for KAIZEN irregularly conducted with evidences 4. Self-monitoring for KAIZEN irregularly conducted with evidences but not reported to QIU/QIT 5. Self-monitoring for KAIZEN regularly conducted with evidences and reported to QIU/QIT regularly 					
HR Empowerment	33	Ask/observe about section training and continuous education on 5S-KAIZEN-TQM Approach are conducted for all categories of the section staff including newly posted staff and students in the section	<ol style="list-style-type: none"> 1. No section training and continuous education 2. Section training and continuous education planed but not conducted 3. Section training and continuous education occasionally conducted 4. Section training and continuous education regularly conducted with evidences 5. Section training and continuous education regularly conducted with evidences, and teaching materials updated 					
	34	Ask/observe about seminar and training for WIT members on 5S-KAIZEN-TQM Approach	<ol style="list-style-type: none"> 1. No plan for seminar and training for WIT 2. Seminar and training for WIT not incorporated in the section plan and not conducted even occasionally 3. Seminar and training for WIT not incorporated in the section plan but conducted occasionally 4. Seminar and training for WIT incorporated in the section plan but not conducted as planned 5. The seminar and training for WIT incorporated in the section plan and conducted as planned 					

Annex 2: QIU/QIT function check sheet

Interview sheet for QIU/QIT (1/2): “Basic hospital information”

Name of the hospital				Date		
Director/ Medial Officer In-charge	Name		Phone			
	E-mail					
Matron / Patron	Name		Phone			
	E-mail					
Hospital Secretary	Name		Phone			
	E-mail					
QIU Head / QIT Chairperson	Name		Phone			
	E-mail					
Total bed capacity						
Total number of departments			Total number of sections			
Total number of hospital staff		Total number of doctors		Total number of technicians		
		Total number of nurses		Total number of Administrative staff		
Number of Hospital Management Team members						
Establishment of Hospital Advisory board (HAB)	Established / Not established (Established year and month:)		Number of HAB members			
1 Establishment of QIU or QIT	Established / Not established (Established year and month:)		Number of Full- time staff			
			Number of Part-time staff			
2 Composition of QIU/QIT	Doctor	A-M/O	C/O	Nurse	Admin.	Lab. Tech.
	Pharmacist					
3 Establishment of QIU/QIT office	<input type="checkbox"/> The office is allocated and adequately equipped with necessary equipment i.e. chairs, tables, computer, shelves etc. <input type="checkbox"/> The office is partially equipped <input type="checkbox"/> Not allocated					
Current QI programs at the hospital	Name of QI programs		Supported by (organization)	Sections practicing the QI program		
Challenges that HMT and QIU/QIT are facing in 5S-KAIZEN-TQM implementation	<ul style="list-style-type: none"> • • • • • 					

Interview sheet for QIU/QIT (2/2): current QIU/QIT status and activities

(*) Dimensions of QIU/QIT function:

IS; Implementation Structure, PL; Planning, IM; Information Management, TF; Training and Follow-up

SQ #	Items	Brief explanation	Answer and Score		(*)
1	Establishment of QIU/QIT	Ask about whether QIU/QIT is established with fulltime / part-time staff	2	Established with fulltime staff	IS
			1	Established with part-time staff	
			0	Not established	
2	Composition of QIU/QIT	Ask about whether QIU/QIT is multidisciplinary members	2	Established with fulltime staff and multidisciplinary members	IS
			1	Established with part-time staff only and multidisciplinary members	
			0	Established but not with multidisciplinary members	
3	Establishment of QIU/QIT office	Ask about whether QIU/QIT office is established with necessary equipment	2	Established with necessary equipment	IS
			1	Established with necessary equipment	
			0	Not established	
4	Allocation of budget for QI activities	Ask whether the hospital allocates specific budget for QI activities	2	Allocated in: <input type="checkbox"/> CHOP / <input type="checkbox"/> Other plans	IS
			1	Not allocated but disbursed from other budget plans sometimes	
			0	Not allocated	
			If the answer is "2", ask how much the budget is allocated for this financial year:		
		If the answer is "1" or "0", ask how QI activities in the hospital are implemented without budget?			
5	Mechanism for increasing hospital revenue	Ask about whether there is any mechanism for increasing hospital revenue by proper application of 5S-KAIZEN	2	Mechanism in place and well followed with evidences	IS
			1	Mechanism in place but not followed	
			0	No mechanism	
		If the answer is "2" or "1", describe how and what the mechanism is:			
6	Declaration of commencement of 5S-KAIZEN	Ask whether MOI/C and other executive HMT members declared commencement of 5S-KAIZEN	2	Declared with written official documents	IS
			1	Declared with no written official document	
			0	Not declared	
7	Roles and responsibilities of QIU/QIT	Ask whether QIU/QIT has own roles and responsibilities. The roles and responsibilities to be written and shared with all hospital staff	2	Developed, written and shared with all hospital staff	IS
			1	Developed and written but known by limited personal	
			0	Not developed	
8	QIU/QIT meeting	Ask about the frequency of QIU/QIT internal meetings	2	Conducted regularly	PL
			1	Conducted irregularly	
			0	Not conducted	
		Frequency: Weekly / Monthly / Quarterly / Other:			
		The latest meeting: Month Year			

SQ #	Items	Brief explanation	Answer and Score		(*)			
9		Ask to show the evidences on QIU/QIT meeting (e.x. minutes / schedule / attendance list etc.)	2	Every evidence is available	IM			
			1	Some of evidence are missing				
			0	Not available				
10	QIU/QIT meeting with HMT	Ask about frequency of the meetings between QIU/QIT and HMT	2	Conducted regularly	PL			
			1	Conducted irregularly				
			0	Not conducted				
			Frequency: Weekly / Monthly / Quarterly / Other:					
			The latest meeting: Month Year					
11		Ask to show the evidences on QIU/QIT meeting with HMT (ex. Minutes, schedule, attendance etc.)	2	Every evidence is available	IM			
			1	Some of evidence are missing				
			0	Not available				
12	QIU/QIT meeting with WITs	Ask about frequency of the meetings between QIU/QIT and WITs	2	Conducted regularly	PL			
			1	Conducted irregularly				
			0	Not conducted				
			Frequency: Weekly / Monthly / Quarterly / Other:					
			The latest meeting: Month Year					
13		Ask to show the evidences on QIU/QIT-WIT meeting	2	Every evidence is available	IM			
			1	Some of evidence are missing				
			0	Not available				
14		Ask about number of staff trained on 5S	3	100% of the staff is trained on 5S	TF			
			2	Between 70% to 99% of the staff is trained on 5S				
			1	Between 40% to 69% of the staff is trained on 5S				
			0	Less than 39% of the staff is trained on 5S				
15	Trained staff on 5S and KAIZEN	Ask about number of staff trained on KAIZEN	3	100% of the staff is trained on KAIZEN	TF			
			2	Between 70% to 99% of the staff is trained on KAIZEN				
			1	Between 40% to 69% of the staff is trained on KAIZEN				
			0	Less than 39% of the staff is trained on KAIZEN				
						Total number of staff in the hospital:		
		Total number of trained staff on 5S: (%)						
		Total number of trained staff on KAIZEN: (%)						
16		Ask about number of areas practicing 5S	3	100% of sections is practicing 5S	TF			
			2	Between 70% to 99% of sections is practicing 5S				
			1	Between 40% to 69% of sections is practicing 5S				
			0	Less than 39% of sections is practicing 5S				
17	Number of sections practicing 5S and KAIZEN	Ask about number of areas practicing KAIZEN	3	100% of sections is practicing KAIZEN	TF			
			2	Between 70% to 99% of sections is practicing KAIZEN				
			1	Between 40% to 69% of sections is practicing KAIZEN				
			0	Less than 39% of sections is practicing KAIZEN				
						Total number of departments in the hospital:		
						Total number of sections in the hospital:		
		Number of sections practicing 5S: (%)						
		Number of sections practicing KAIZEN: (%)						
18	Establishment of WIT	Ask about establishment of WITs at section level	3	All areas have WITs (all areas)	IS			
			2	Between 70% to 99% of sections have WITs				
			1	Between 40% to 69% of sections have WITs				
			0	Less than 39% of sections have WITs				
		Total number of WIT in the hospital: (%)						

SQ #	Items	Brief explanation	Answer and Score		(*)
19	Roles and responsibilities of WIT	Ask whether WITs have own roles and responsibilities. These are supposed to be written and shared with all staff	2	Developed, written and shared with all hospital staff	IS
			1	Developed and written but known by limited personal	
			0	Not developed	
20	Internal monitoring for 5S and KAIZEN	Ask about frequency and tools of internal monitoring by QIU/QIT to WITs	2	Regularly conducted	PL
			1	Irregularly conducted	
			0	Not conducted	
			Frequency: Weekly / Monthly / Quarterly / Other:		
			The latest internal monitoring: Month Year		
Internal monitoring tools: <input type="checkbox"/> Available / <input type="checkbox"/> Not available					
21		Ask to show documents related with internal monitoring (ex. schedule, tool(s), monitoring results, pictures)	2	All documents are well documented, kept in QIU/QIT file, and shared with HMT and hospital staff	IM
			1	Some of documents are documented and kept in QIU/QIT file but some are missing	
			0	Not documented	
22	Internal evaluation for 5S and KAIZEN	Ask about frequency and tools of internal evaluation by QIU/QIT to WITs	2	Regularly conducted	PL
			1	Irregularly conducted	
			0	Not conducted	
			Frequency: Weekly / Monthly / Quarterly / Other:		
			The latest internal evaluation: Month Year		
Internal evaluation tools: <input type="checkbox"/> Available / <input type="checkbox"/> Not available					
23		Ask to show documents related with internal evaluation (ex. schedule, tool(s), monitoring results, pictures)	2	All documents are well documented, kept in QIU/QIT file, and shared with HMT and hospital staff	IM
			1	Some of documents are documented and kept in QIU/QIT file but some are missing	
			0	Not documented	
24	Action plan for QIU/QIT	Ask whether QIU/QIT develops, followed and updated action plan for QI activities	2	Develop, followed and updated	PL
			1	Developed but not updated	
			0	Not developed	
25		Ask whether the plan incorporates 5S-KAIZEN activities	2	Incorporated 5S-KAIZEN into QIU/QIT action plan	PL
			1	Developed but not incorporated into QIU/QIT plan	
			0	Not developed	
26	In-house recognition / awarding events	Ask about any in-house recognition events and awarding events to 5S-KAIZEN implementation in the hospital	2	Conducted regularly as planned	PL
			1	Irregularly conducted	
			0	Not conducted	
		The latest event: Month Year			
		Details of in-house recognition / awarding events:			
27	Records on QI activities	Ask about keeping records on QI activities in the hospital	2	All are kept in "QIU/QIT file"	IM
			1	Some are kept in "QIT file"	
			0	No recorded	
28	Annual report on QI programs and activities	Ask about a way of compilation of annual report on QI in the hospital.	2	Developed and submitted to HMT	IM
			1	Developed but not submitted to HMT	
			0	Not developed	
29	Recording and sharing good practices of 5S-KAIZEN	Ask about a way of recording and sharing good practices of 5S and KAIZEN activities	2	Good practices are recorded and shared with all staff	IM
			1	Good practices are recorded but shared with limited staff	
			0	Not recorded	

Annex 3: KAIZEN Progress check sheet

Date of monitoring		Date of last QIT consultation	
Section		Number of WIT members	

Step 1: Selection of KAIZEN Theme

1.1 Problem statement	0: Not described	1: Described partially	2: Described perfectly
1.2 Matrix diagram	0: Not developed	1: Developed wrongly	2: Developed correctly
1.3 Statement of KAIZEN theme	0: Not stated	1: Stated wrongly	2: Stated clearly
Selected KAIZEN Theme:			
Problem statement * Ask what is the problem and why do they need to solve this situation:			

Step 2: Situation Analysis

1.1 Identification of contributing factors		0: Not identified	1: Identified wrong factors	2: Identified proper factors
Total frequency of contributing factor in Step 2				
2.2 Description of data collection methods (Data collection period, data source, Data collection methods etc.)		0: Not described	1: Described partially	2: Described perfectly
2.3 Development of data table	Calculation accuracy, Order of the contributing factors etc.	0: Not developed	1: Developed wrongly	2: Developed perfectly
2.4 Development of Pareto chart	Scales, 80% Cut-off line, Order of contributing factors, Reflection of the frequencies, Reflection of the accumulation ratio etc.	0: Not developed	1: Developed wrongly	2: Developed perfectly
2.5 Characteristic value (*)		0: Not defined	1: Defined but not measured/counted	2: Measured/counted and recorded
Characteristic value identified		* Characteristic value; countable/measurable indicators or data that can measure degree of improvement, related to the KAIZEN theme (e.g. time for waiting, time for a procedure, expenditure, revenue amount, work-burden, satisfaction, service quality etc.)		
Real amount/quantity of characteristic value in Step 2				

Step 3: Root cause analysis

3.1 Effective utilization of Fishbone diagram	0: Not developed	1: Developed wrongly and/or root causes not well identified	2: Developed effectively to identify all root causes
3.2 Description/Sentence completeness	0: Sentences of all causes and effects not completed	1: Sentences of some causes and effects not completed	2: Sentences of all causes completed
3.3 Depth of Why-Because analysis	0: WHY-BECAUSE is not asked	1: WHY-BECAUSE asked not enough	2: WHY-BECAUSE is asked enough

Step 4: Identification of Countermeasure

4.1 Tree diagram	0: Not developed	1: Developed wrongly	2: Developed correctly
4.2 Matrix diagram	0: Not developed	1: Developed wrongly	2: Developed correctly

Step 5: Implementation of counter measure

5.1 Development of action plan by using 5W1H	0: Action plan not developed	1: Action plan developed wrongly	2: Action plan developed properly
5.2 Countermeasure implementation	0: Not implemented	1: Partially implemented	2: Fully implemented
5.3 Monitoring checklist	0: Not developed	1: Developed but not used	2: Used properly

Step 6: Effectiveness check

6.1 Development of comparison table	0: Not developed	1: Developed wrongly	2: Developed correctly					
<table border="1"> <tr> <td>Total frequency of contributing factor in Step 6</td> <td rowspan="2"></td> <td rowspan="2"></td> <td rowspan="2"></td> </tr> <tr> <td>Reduction rate (%) comparing with Step 2</td> </tr> </table>	Total frequency of contributing factor in Step 6				Reduction rate (%) comparing with Step 2			
Total frequency of contributing factor in Step 6								
Reduction rate (%) comparing with Step 2								
6.2 Development of comparison Pareto chart	0: Not developed	1: Developed wrongly	2: Developed correctly					
6.3 Scale of Pareto hart	0: Scale not written	1: Scale written wrongly	2: Scale written correctly					
6.4 Characteristic Value	0: Not defined	1: Defined but not measured/counted	2: Measured/countred and recorded					
<table border="1"> <tr> <td><i>Real amount/quantity of chalacteristic value in Step 6</i></td> <td></td> <td></td> <td></td> </tr> </table>	<i>Real amount/quantity of chalacteristic value in Step 6</i>							
<i>Real amount/quantity of chalacteristic value in Step 6</i>								

Step 7: Standardization

7.1 Identification of effective measures	0: Not identified	1: Identified wrongly	2: Identified correctly
7.2 Practice of standardized activities	0: Not implemented	1: Implemented partially	2: Implemented continuously
7.3 Development of 5W1H standardization plan	0: Not developed	1: Developed wrongly	2: Developed correctly
7.4 Monitoring of implementation of effective measures	0: Monitoring checklist not developed	1: Monitoring checklist developed but not used	2: Monitoring checklist used

Suggestion and recommendaton

.
--

Annex 4: KAIZEN Supportive Supervision checklist

Name of section: _____

Name of WIT chairperson: _____

Number of WIT members: _____

Date: ____ / ____ / 20____

KAIZEN Theme: _____

Date of starting KAIZEN: ____ / ____ / 20____

Date of finishing KAIZEN: ____ / ____ / 20____

	#	Points to check	Yes	No	DD/MM	Your name
Before KAIZEN	1	Number of WIT members is listed on the document of KAIZEN			/	
	2	All KAIZEN steps are planned to complete within 6 months			/	
	3	Document of KAIZEN activity is kept in accessible			/	
	4	Starting-date of KAIZEN case is recorded			/	
Step 1	5	KAIZEN theme is selected as a problem which can be solved within the section/unit			/	
	6	KAIZEN theme was selected by utilizing Matrix Diagram properly			/	
	7	The KAIZEN theme is written in “positive manner”			/	
	8	Check “problem statement” is written properly with necessary contents			/	
Step 2	9	Appropriate quantitative data is collected as contributing factor(s) related to KAIZEN theme			/	
	10	Data source is appropriate			/	
	11	Data collection method is appropriate			/	
	12	Period of data collection is appropriate			/	
	13	All the records were kept for data collection			/	
	14	On the data compilation table, calculations of cumulative frequency and ratio are done accurately			/	
	15	Pareto Chart is properly developed based on the data compilation table			/	
	16	Characteristic value(s) is identified and measured			/	
Step 3	17	Contributing factors identified in Step 2 are used as a head of Fishbone diagram			/	
	18	Fishbone diagram is developed for each vital few identified in KAIZEN Step 2			/	
	19	Sentence of the head of Fishbone diagram is stated as “Why (the contributing factor) happened?”			/	
	20	“Cause-Effect (Why-Because)” relation is clarified			/	
	21	“Why-Because” is asked enough to find root causes			/	
	22	Sentence used in the Fishbone Diagram are completed			/	
	23	Sentence related to no-resources such as No money, No human resource, No material etc. is not observed in Fishbone diagram			/	

	#	Points to check	Yes	No	DD/MM	Your name
Step 4	24	All the root causes identified in Step 3 are reflected in Tree Diagram			/	
	25	Detailed countermeasures (possible corrective actions) are identified			/	
	26	There is no contradiction among identified countermeasures			/	
	27	Feasibility check for identifying practicable countermeasures is appropriately done			/	
	28	The scale and cutoff point for feasibility check are clarified			/	
Step 5	29	All the countermeasures judged as practicable actions are reflected in the action plan			/	
	30	The action plan are developed based on “5W1H”			/	
	31	Appropriate timing is given to implement all the countermeasures			/	
	32	Date of monitoring a implementation progress/status of the countermeasures is written			/	
	33	Availability of evidences of countermeasures implemented in KAIZEN Step 5 e.g. Training manuals, SOPs, Training report etc.			/	
Step 6	34	Frequency of the same contributing factors is collected by taking the same methodologies taken in KAIZEN Step 2			/	
	35	Comparison table developed properly with comparison data of frequency, cumulative number frequency, and cumulative ration			/	
	36	Pareto Chart is properly developed based on the comparison table			/	
	37	Effective countermeasures are identified and listed			/	
	38	Ineffective countermeasures are identified and listed			/	
	39	The same characteristic value(s) identified in Step 2 is measured and compared with the data before KAIZEN			/	
Step 7	40	All the effective countermeasures are reflected on standardization plan			/	
	41	Standardization plan is developed based on “5W1H”			/	
	42	Monitoring checklist for checking implementation progress/ status of standardized activities is developed and used			/	
	43	The standardization plan is shared with all staff working in the section/unit			/	
Common Issues	44	After completion of one KAIZEN case, check whether discussion and action are taken for next KAIZEN case or not			/	
	45	All records of each KAIZEN step are kept properly			/	
	46	Both starting and completing date of each KAIZEN step are clearly recorded			/	
	47	Communication between QIT and KAIZEN members on KAIZEN case is done regularly			/	



Supported by Japan International Cooperation Agency (JICA)