The United Republic of Tanzania

Ministry of Health and Social Welfare

Health Quality Assurance Division

Implementation Guidelines for 5S-KAIZEN-TQM Approaches in Tanzania

"Foundation of all Quality Improvement Programs"

3rd Edition

March 2013

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4. Mwongozo wa Taifa wa kukinga Maambukizo katika Utoaji wa Huduma za Afya: Kiongozi cha Mfukoni wa Watoa Huduma za Afya Tanzania, MoHSW (2007)

5. Quality Improvement – Infection Prevention and Control Orientation: Guide for Participants, MoHSW (2008)

6. Implementation Guidelines for 5S-CQI-TQM Approaches in Tanzania: "Foundation of all Quality Improvement Programme"; First Edition, MoHSW (2009)

7. National Supportive Supervision Guidelines for Healthcare Services, MoHSW (2010)

8. Implementation Guidelines for 5S-CQI (KAIZEN)-TQM Approaches in Tanzania: "Foundation of all Quality Improvement Programme"; Second Edition, MoHSW (2011)

9. Tanzania Quality Improvement Framework 2011-2016, MoHSW (2011)

10. National Infection Prevention and Control Standards for Hospitals in Tanzania, MoHSW (2012)

11. National Communication Strategy for Infection Prevention and Control 2012-2017, MoHSW (2012)

12. Implementation Guidelines for 5S-CQI (KAIZEN)-TQM Approaches in Tanzania: "Foundation of all Quality Improvement Programme"; Third Edition, MoHSW (2013)

13. Mwongozo wa Utekelezaji wa Najia za S5-UUE(KAIZEN)-UUU Tanzania "Msingi wa Programu zote za Uimarishaji Ubora", MoHSW (2013)

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ACRONYMS

AAKCP	Asia-Africa Knowledge Co-creation Program
APHFTA	Association of Private Health Facilities in Tanzania
BMC	Bugando Medical Centre
CHMT	Council Health Management Team
CD	Capacity development
CMO	Chief Medical Officer
CQI	Continuous Quality Improvement
CSSC	Christian Social Services Commission
DAP	Directorate of Administration and Personnel
DCS	Directorate of Curative Services
DH	District Hospitals
DHR	Directorate of Human Resource Development
DHS	District Health Secretary
DMO	District Medical Officer
DNO	District Nursing Officer
HCWM	Health Care Waste Management
HIC	Health Improvement Collaborative
HPAT	Hospital Performance Assessment Tool
HR	Human Resource
HRO	Highly Reliable Organization
HRP	Hospital Reform Program
HSIU	Health Service Inspectorate Unit
HSSP	Health Sector Strategic Plan
IPC	Infection Prevention and Control
JICA	Japan International Cooperation Agency
JIT	Just In-Time
KAIZEN	(Japanese word) it is Continuous Quality Improvement in English
KCMC	Kilimanjaro Christian Medical Centre
MDGs	Millennium Development Goals
M & E	Monitoring and Evaluation
MMAM	*Mpango wa Maendeleo ya Afya ya Msingi*
	(Kiswahili abbreviation for Primary Health Services Development Program)-PHSDP

MNH	Muhimbili National Hospital
MoHSW	Ministry of Health and Social Welfare
MRH	Mbeya Referral Hospital
PHSDP	Primary Health Services Development Program
QA	Quality Assurance
QC	Quality Control
QI	Quality Improvement
QIA	Quality Improvement Approach (es)
QIP	Quality Improvement Program
QIT	Quality Improvement Team
RRH	Regional Referral Hospital
RHMT	Regional Health Management Team
RHS	Regional Health Secretary
RMO	Regional Medical Officer
RNO	Regional Nursing Officer
SBM	Service Based Management
SOP	Standard Operating Procedures
TOT	Training of Trainers
TQIF	Tanzania Quality Improvement Framework
TQM	Total Quality Management
WIT	Work Improvement Team
ZRC	Zonal Resource Centre

FOREWORD

Health services provided in health facilities in the country leave much to be desired in terms of quality. Inadequate funding, shortage of human resources and other key health resources, poor infrastructure, uncoordinated quality improvement program (QIP), and lack of comprehensiveness on the quality improvement initiatives, have been the stumbling blocks. However, successful quality improvement in health services depends mostly on the ability to create and sustaining a robust and an integrated foundation for the existing QIPs and frameworks. This is well stipulated in the Health Policy, Primary Health Care Development Program and the HSSP 3.

The Japanese Government, through Japan International Cooperation Agency (JICA); recognized the need in African Countries to have such QIP or framework. Using the experience gathered in Asian countries, JICA promoted a knowledge creation avenue for quality improvement, to several African countries including Tanzania. This knowledge sharing is called, "Africa – Asia Knowledge Co-creation Program (AAKCP)", and the approach that is advocated is the 5S-CQI (KAIZEN)-TQM, using the 5S principle *(sort, set, shine, standardize and sustain)*, as entry point. Its implementation started in 2007 at Mbeya Consultant Hospital and the first implementation guidelines were printed in 2009.

The approach has been rolled out to 56 hospitals (as of November 2012) of which 13 hospitals are implementing KAIZEN process. We commend the efforts done by the JICA HRH Development Project for supporting seven (07)-5S Training of Trainers (ToTs) and two (02)-KAIZEN ToTs, as well as, one refresher training that have facilitated implementation of the rollout with a face of Public Private Partnership (PPP).

The development of the third edition has come two (2) years down the line after launching the second edition in November 2011. The need for review has been contributed by experince from implementing hospitals as gathered during supervision visits, as well as, from national facilitators who helped to reveal some gaps in the second edition. This third edition includes additions illustrated in diagrams and figures that make it easier for users to understand.

The guideline is organized into seven chapters that take a user from: current situation of QI activities in Tanzania; to national rollout plan of 5S-KAIZEN-TQM approaches; to basic concepts of 5S-KAIZEN-TQM; to implementation of 5S-KAIZEN-TQM; to five-S (5S) tools for actual implementation; to quality control (QC) tools; and lastly, monitoring and evaluation of 5S-KAIZEN-TQM activities. This logical flow gives the reader a step-by-step follow-through that assists acquisition of the knowldege and skills necessary to implement and evaluate the approach. It should be noted that some chapters, especially the quality control tools use tools that required further readings to master their application better (providing fine details for each of the tools is beyond the scope of these guidelines).

The 5S-KAIZEN-TQM approach is being implemented as a foundation that makes all other quality improvement approaches at health facility to work efficiently. Success stories and findings of the approach at hospital level have been shared in various forums including the National Quality Improvement Forum (NQIF) that was launched in November 2011. We encourage health workers and other stakeholders to visit the NQIF website: http://www.nqif.or.tz regularly for more information on quality improvement issues in the country.

As experience from implementation and operational research is gained, the document will be reviewed. Being a living document, your comments for futher improvement of the 5S-KAIZEN-TQM guidelines are welcome. The Ministry of Health and Social Welfare will work on all comments and inputs to ensure quality 5S-KAIZEN-TQM implementation guidelines in the health sector. Futhermore,

the implementation of the approach in other sectors in Tanzania *(e.g., Education, and Energy-Tanesco)*, is expected to give more lessons to the health sector. It should be noted that, achievement in its implementation in health sector is embedded in the commitment of health facilities leadership, health workers, and other stakeholders.

Dr. Donan Mmbando

Acting Chief Medical Officer

ACKNOWLEDGEMENT

The development and printing of the 5S-KAIZEN-TQM guidelines series (first edition was printed in May 2009, the second in November 2011, and third March 2013) is a result of relentless efforts of facilitators, participants and experts of 5S-KAIZEN-TQM approaches. The Ministry of Health and Social Welfare (MoHSW) would like to acknowledge the contributions of facilitators from the following: Kilimanjaro Christian Medical Centre (KCMC) Super Specialist Hospital, Mbeya Super Specialist Hospital, Muhimbili National Hospital, and from Departments, Sections and Units of the MoHSW.

Sincerely gratitude go to experts of 5S-KAIZEN-TQM from JICA-HRH Development Project Office – *Mr. Hisahiro Ishijima, Shizu Takahashi, and Nobuko Yamagishi,* as well as, experts from outside the country for their valuable inputs and guidance in development of the 5S-KAIZEN-TQM implementation guidelines. It goes without saying that we acknowledge all the other staff in the JICA-HRH Development Project Office for their hard work and for linking the experts to the MoHSW-Departments, Sections and Units, and to the hospitals implementing the approach.

The Ministry would like to extend sincere thanks to all participants of the 5S-ToTs and KAIZEN-ToTs, as well as, those who took part in study tours to Mbeya Super Specialist Hospital, Tosamaganga Designated District Hospital and Muhimbili National Hospital for their constructive feedbacks on the guidelines and other training materials.

The Ministry would like to thank the Staff of the Health Services Inspectorate and Quality Assurance Section (HSIQAS) under the leadership of Assistant Director - Dr. Henock A.M. Ngonyani, for their tireless efforts to coordinate the review process of the third edition.

Sincere appreciation goes to the Government of Japan through Japan International Cooperation Agency (JICA), for choosing our country to be one of the supported countries in Africa and for the financial support to implement the 5S-KAIZEN-TQM approach. These implementation guidelines will remain as a symbol of the good working relationship between the Ministry of Health and Social Welfare, and Japan International Cooperation Agency (JICA).

Lastly, the Ministry of Health and Social Welfare would like to acknowledge all health workers who use the implementation guidelines consistently to improve the services provided in their health facilities. As put by *Johann Wolfgang von Goethe:* **"knowing is not enough, we must apply; willing is not enough, we must do"**. It is the expectation of the Ministry that all health workers will implement the 5S-KAIZEN-TQM approach as per the guidelines.

Dr. Mohamed Ally Mohamed

Director of Health Quality Assurance

EXECUTIVE SUMMARY

Background

In Africa, it has often been pointed out that the management of the hospital services provision system has some challenging aspects. Under the chronic shortage of medical resources, the challenge to be tackled is a matter of management of this system for delivering obtainable best hospital services. Asian countries also faced same kinds of challenges in the hospital services provision. To improve the situation, some Asian countries took action to improve quality of health care using **5S (Sort, Set, Shine, Standardize and Sustain)** principles, which were developed in Japanese manufacturers such as Toyota to improve quality of their products and client satisfaction, in collaboration with Japan International Cooperation Agency (JICA).

In 2006, based on the observation of Asian countries movement, JICA planed to conduct a training course for supporting African developing countries to gain skills and knowledge for TQM for better hospital services. The course is named as Asia-Africa Knowledge Co-creation Program (AAKCP). AAKCP aims to provide the forum where Asian and African countries share knowledge and experiences, and thereby facilitate each participating country to create its own method of development that suits best to each country's contexts.

Several African countries were informed about the opening of AAKCP training course, and fifteen (15) African countries (Eritrea, Kenya, Madagascar, Malawi, Nigeria, Senegal, **Tanzania**, Uganda, Niger, Mali, Benin, Morocco, DRC, Burkina Faso, and Burundi) participated in total since 2007. The Ministry of Health and Social Welfare (MoHSW) selected Mbeya Referral Hospital (MRH) as the AAKCP pilot project hospital.

Official Adoption of 5S-KAIZEN-TQM approaches

AAKCP Initial Seminars were conducted in March 2007 followed by AAKCP field workshop in Sri Lanka in July 2007. A total of four senior officers from MRH were trained in those workshops. After the two workshops, MRH started to implement 5S-KAIZEN-TQM activities since August 2007. The workshop's feedback provided to Chief Medical Officer (CMO) in August 2007. CMO decided to share 5S-KAIZEN-TQM concepts with other Ministry of Health and Social Welfare officials and Hospital Management Team of Muhimbili National Hospital (MNH) and MNH started to implement 5S-KAIZEN-TQM approaches since October 2007. Some hospitals in the Southern zone also started implementation in December 2007.

According to the monitoring and periodical evaluation of 5S activities at MRH, MNH, and the four district hospitals in southern zone (Masasi, Newala, Nachingwea and Tandahimba), 5S-KAIZEN-TQM approach was verified as a practical, cost effective and efficient approach for improvement of working environment that supports the effective implementation of quality improvement approaches. Therefore, Ministry of Health and Social Welfare decided to adopt 5S-KAIZEN-TQM concepts officially as a foundation of all quality improvement approaches, and to scale up this approach to other hospitals.

MoHSW revised Tanzania Quality Improvement Framework (TQIF). The second version of TQIF was developed and launched in November 2011 at the time of 1st National Quality Improvement Forum. Moreover, MoHSW is also worked for development of QI strategic Plan in 2012.

Create work environment conducive to provide appropriate health services with 5S-KAIZEN-TQM approaches is well documented in both important documents.

Up to November 2012, 56 hospitals including Consultants, Regional, Districts, and Faith Based Designated, are implementing 5S activities, and 13 hospitals were trained on KAIZEN approach.

5S as an entry point of all Quality Improvement Programs (QIPs)

5S is defined as a management tool, which originated in Japanese manufacturing sector. It is used as a basic, fundamental, systematic approach for productivity, quality and safety improvement in all types of organizations.

Usually, improvement of work processes often is sustained only for a while, and workers drift back to old habits and managers lose the determination and perseverance. 5S in contrast involves all staff members in establishing new disciplines so that they become the new norms of the organization, i.e., internalization of concept, and development of a different culture.

Although the **5S** originated in the manufacturing environment, they translate well to other work situations including hospitals, general offices, telecommunication companies, and etc. **5Ss** are abbreviations of the Japanese words *Seiri, Seiton, Seiso, Seiketsu, and Shitsuke*. In English, 5Ss are translated as *Sort, Set, Shine, Standardize, and Sustain*. In Tanzanian context, Kiswahili words are more effective for people to understand easily thus, facilitators of 5S-KAIZEN-TQM have translated 5S English words into Kiswahili words and those are: **Sasambua** (Sort), **Seti** (Set), **Safisha** (Shine), **Sanifisha** (Standardize) and **Shikilia** (Sustain).

5S is the initial step towards establishing Total Quality Management. There will be no conflict in the implementation of 5S activities even though his or her organization is implementing other quality improvement approach. 5S will support all quality improvement approaches to move forward.

Way forward

The Ministry plans to:

- Rollout 5S-KAIZEN-TQM concept and M&E method to all Regional Health Management Teams (RHMT) and Council Health Management Teams (CHMTs)

- Scale-up the 5S-KAIZEN-TQM approaches and 5S implementation to all Public hospitals

- Scale up the concepts to health training institutions for teaching the concepts to trainees and students

- Sharing good practices of 5S-KAIZEN-TQM activities with Private health sector through Association of Private Health Facilities in Tanzania (APHTA) and Christian Social Service Commission (CSSC) and other relevant organizations

- Using 5S-KAIZEN-TQM as a foundation of all other quality improvement approaches

- Institute a regular M & E system reinforcing on the 5S-KAIZEN-TQM logical framework for Tanzanian context

- Continuous provision of technical support to all hospitals implementing 5S-KAIZEN-TQM, to ensure that mechanisms for sustaining

- Strengthen South – South Cooperation with other African and Asian countries

Chapter 1:

Current situation of QI activities in Tanzania

1.1 Introduction

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)

Ministry of Health and Social Welfare (MoHSW) established Health Service Inspectorate Unit (HSIU) in 1998, under the Office of Chief Medical Officer to take responsibilities on the following main functions:

- Conduct inspection of health care services,
- Coordination of Supportive Supervision,
- Coordination of Quality Improvement related training,
- Coordination of Medical Audit and,
- Collection and dissemination of all experiences, techniques, data and references in regard to quality

Under the MoHSW organization structure changes, Department of Health Quality Assurance is established in 2012 and HSIU is also promoted to be one of the sections of the department so called, "Health Services Inspectorate and Quality Assurance Section (HSI & QAS)".

The purpose of establishing Department of Health Quality Assurance is to provide expertise on health quality management and improvement for sustainable health services.

The main functions of the HSI & QAS are to:

- Prepare and disseminate in collaboration with key stakeholders;
- Health services inspection and supervision policy guidelines;
- National healthcare services standards and indicators;
- Quality assurance/quality improvement policy guidelines in healthcare; and
- Health services inspection and supervision guidelines for public and private health facilities and training institutions;
- Prepare and coordinate implementation of the integration of health services guidelines;
- Coordinate health services inspection and supervision to RHMTs in regard to QI in healthcare;
- Monitor and evaluate implementation of health services inspection and supervision;
- Submission of inspection and supervision reports to relevant authorities/organs with requisite follow-up measures and actions;
- Coordination activities as the focal point in QI in healthcare in the health sector;
- Collection and dissemination of national and international experience, techniques, and data references in regard to QI in healthcare; and
- Work as a national QI Secretariat to the National QI Committee.

1.2   Challenges for improving Quality in health facilities

Despite all the efforts taken so far to improve the quality of health services provided, there has been little improvement in services rendered in the health facilities. Several reasons can be attributed to this situation such as: weak implementation structure for Quality Improvement approach; difficulty of changing attitude among health workers; shortage of human resources; and unreliable resource supplies and allocation. Another issue is that different development partners introduced several QI approaches to health sector in Tanzania. However, those QI approaches are not integrated and health workers on the ground are confused with those approaches.

1.3   Steps taken by MoHSW

The first steps taken by the Ministry included the Health Sector Reforms of 1994, which have been progressively implemented. In 2004, HSIU developed "Tanzania Quality Improvement Framework" (TQIF). The framework has two main purposes; firstly, to encourage all health workers at all levels and other stakeholders in the sector to develop a culture of quality in health care; and secondly, to outline necessary actions for improvement and institutionalization of quality in health care. The Unit also developed infection prevention and control (IPC) guidelines as one of the crosscutting issues in healthcare provision in 2004; its pocket guide and Kiswahili version were developed in 2007.

In 2009, an integrated guideline called: Quality Improvement and Infection Prevention and Control Guidelines for health care services in Tanzania were developed. These aimed at improving the quality domain of safety of health care (to clients and providers) during services delivery. Training of health workers on Infection Prevention and Control (IPC) has been ongoing with some selected topics on QI and supportive supervision. Moreover, Directorate of Hospital Services (currently, "Curative services") developed "Hospital Reform Guideline at Regional and District level" in 2005 and Continuous Quality Improvement – Total Quality Management (CQI (KAIZEN)-TQM approaches are emphasized to improve quality of hospital services[1]; and nearly 40 hospitals were trained.

In 2011, the Ministry in collaboration with Jhpiego, has developed Infection Prevention and Control Standards that are implemented using the Standard Based Management and Recognition (SBM-R) Approach in National, Consultant, Regional Referral and District Hospitals in phases. Application of these standards aim at ensuring safety of health services delivered to clients in health facilities.

The Directorate of Curative Services is also developing standards for hospitals and a system to strengthen laboratory services called: Step-Wise Certification Towards Accreditation (SWCTA). Efforts to strengthen the capacity of RHMTs to supervise the Council Health Management Teams (CHMTs) and Regional Referral Hospitals started in 2008 (phase one) and is continuing its phase two since 2011 with support of JICA.

MoHSW started to revise TQIF since 2010. The review process was completed in 2011 and launch 2nd TQIF in November 2011 at 1st National Quality Improvement Forum. It is revised more in practical way to orient health managers and health workforces in both public and private, and development partners to practice effective, efficient and sustainable quality improvement program with the existing resources.

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1   Refer on page 12 and 13 of " Hospital Reform Guideline at Regional and District level" in 2005

1.4. 5S-KAIZEN-TQM as the new impetus for QI in all health facilities

Due to the experiences obtained from the national rollout of 5S-KAIZEN-TQM approaches since 2008, and reaction from health facilities and workforces, it can clearly say that 5S-KAIZEN-TQM approaches are the new impetus for quality improvement.

Establishment of Quality Improvement Team (QIT) was instructed to all hospitals in public sector in 2005 with the "Hospital Reform Guideline at Regional and District level". However, majority of hospitals could not establish QIT. According to the field report that hospitals that established "functional" QIT are equals to the hospital implementing 5S approach.

Other QI approach and program are also recognizing the effects of 5S-KAIZEN-TQM approaches. Infection Prevention and Control (IPC) Program took the 5S concepts into the program. Lecture about5S approach is given during the IPC training to hospitals. Hospital Reform Program of MoHSW is also preparing the integration of 5S-KAIZEN-TQM approaches into the Program for further rollout and makes the approaches sustainable.

1.5. Successes of 5S-KAIZEN-TQM approach

5S-KAIZEN-TQM approaches were introduced through Asia-Africa Knowledge Co-creation Program (AAKCP), which was organized by JICA in collaboration with Ministry of Health, Sri Lanka from 2007 to 2011. Since the first TOT on 5S-KAIZEN-TQM was conducted; MoHSW managed to train 46 hospitals at different level, and monitor them regularly. The number of trained hospitals is much higher than other African countries.

Success of 5S-KAIZEN-TQM approaches in Tanzania was shared with other African countries in many occasions. One should notice that MoHSW has been receiving trainees on 5S-KAIZEN-TQM approaches from Malawi, Kenya, and Uganda since 2010. These successes were also presented at Global Health Workforce Forum, which was conducted in January 2011 in Bangkok, Thailand.

JICA Headquarter recognizes that Tanzania is the best performing country of 5S-KAIZEN-TQM Implementation among 15 African countries. This is evidenced by the fact that Mbeya Referral Hospital was chosen as the field-training site of the KAIZEN training for 6 African countries, which was conducted in Japan and Tanzania in October 2011.

Additionally, cooperation between Sri Lanka and Tanzania on 5S-KAIZEN-TQM approach, and Tanzanian's effort to support other African countries for expansion of the approaches were recognized globally and MoHSW received "Solution Award "at Global South-South Cooperation Expo 2012 in Vienna.

Chapter 2:

National Rollout Plan of 5S-KAIZEN-TQM Approaches

2.1. National Rolling out of 5S-KAIZEN-TQM

The first step for rolling out of 5S-KAIZEN-TQM approaches is to conduct Training of Trainers (TOT) to hospitals or local health authority. Ministry of Health and Social Welfare conducted series of TOT on 5S-KAIZEN-TQM approaches since 2008 in collaboration with Japan International Cooperation Agency (JICA). Additionally, Hospital Reform Program under Department of Clinical Services recognized the importance of the approaches and conducted refresher training for 4 hospitals with their own budget in November 2012.

Table 1: List of TOT conducted since 2008 in Tanzania

	Main topics on	*Target group*	*Timing*
1	5S TOT	Consultant and Regional Referral hospitals	Jun. 2008
2	5S TOT	Regional Referral and District hospitals	May 2009
3	5S TOT	Specialized, Regional Referral and District hospitals	May 2010
4	KAIZEN TOT	Hospitals implementing S4/S5 well	May 2011
5	5S TOT	RHMTs, CSSC, APHFTA, hospitals	Jul. 2011
6	5S TOT	CHMTs and District hospitals	Aug. 2011
7	5S TOT	RHMTs	Dec. 2011
8	KAIZEN TOT	Hospitals implementing S4/S5 well	May 2012
9	5S TOT	CHMTs and District hospitals	Aug. 2012
10	Refresher training on 5S	Regional Referral Hospitals	Nov. 2012
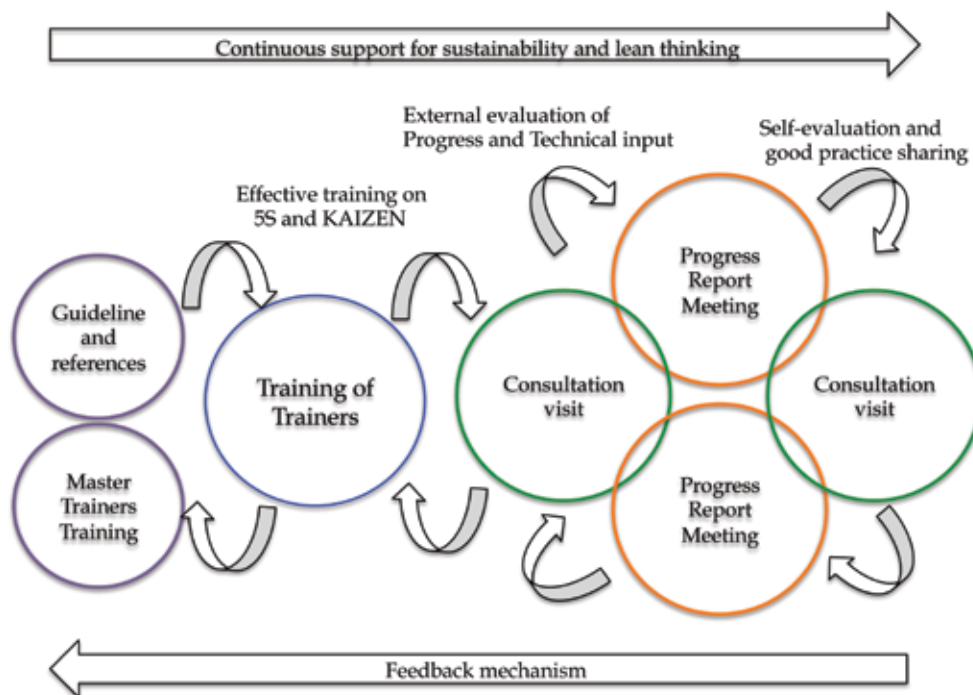
Diagram 1: National Rollout Model for 5S-KAIZEN-TQM approach

After the TOT, all trained personnel from hospitals or local health authorities are recognized as "National" or "Regional" or "District" trainers and they were expected to implement 5S-KAIZEN-TQM activities at their organization or hospital as a team. Then, after organization or hospital successfully adopts the concept and practicing the approach continuously, they are encouraged to train or provide technical inputs to lower facilities.

In 2011, all RHMTs were trained on 5S-KAIZEN-TQM approaches. Based on the Consultation visit's results, it is found that some region like Singida, utilizing Regional Facilitators to train CHMTs and district hospitals within their region by using their own resources.

2.2. Training on 5S-KAIZEN-TQM

2.2.1. Training of Trainers (TOT)

As mentioned in section 2.1, MoHSW organizes two types of TOT for health facilities, local health authorities, professional bodies, private organization and institution. One is mainly focused on basic 5S approach, and other one is focused on KAIZEN approach.

TOT on basic 5S approach covers basic knowledge on Quality and its improvement, mindset changes, QI implementation structure for health facilities, 5S-KAIZEN-TQM concept, 5S implementation method, and M&E of 5S activities.

TOT on KAIZEN Approach is very much different from basic 5S TOT. KAIZEN TOT only focuses on how to practice Quality Control Story (QC story). Criteria to participate KAIZEN TOT are that the hospital practicing 5S and achieved S4 (Standardize) and S5 (Sustain) level activities to organize working environment well.

Since strong leadership is a key for successful implementation of 5S-KAIZEN activities, MoHSW usually invite leaders and managers to both TOTs. Medical officer in-charge, Matron/Patron, and Hospital secretary are usually invited from hospital level.

The approaches were well disseminated to Regional Health Management Team (RHMT), and it is on the process of disseminating to Council Health Management Teams (CHMTs). Knowledge and skills on 5S will be used effectively whenever RHMT and CHMTs conduct supportive supervision, which will always include a component of improvement of working environment.

When training is conducted for Regional Health Management Teams and Council Health Management Teams, Regional Medical Officer (RMO)/ District Medical Officer (DMO), Regional Nursing Officer (RNO)/ District Nursing Officer (DNO), and Regional Health Secretary (RHS) / District Health Secretary (DHS) are usually invited to basic 5S TOT.

Private organization/institutions usually select training officers, Human resource officers or Quality control officers to participate the basic 5S TOT. CSSC, APHFTA and CCBRT have sent their employee to participate in 5S TOT in July 2011. Right after the TOT, APHFTA conducted TOT for 11 private health facilities with their own budget.

2.2.2. Training of health workers at facility level

All trained personnel through TOT of 5S–KAIZEN are expected to share the obtained knowledge and skills with colleagues and subordinates of the health facilities. All teaching materials are given to the participants and allow them to use it for "in-house training".

From the experiences of 5S-KAIZEN-TQM Rollout, many hospitals do not have enough budgets or not allocate budget for "in-house training". Therefore, the following issues should be taken care by Hospital Management Team (HMT) and Quality Improvement Team (QIT) in order to ensure training of all health workers in the facility;

- Proper "in-house training plan" and budget allocation by HMT and QIT
- Using gathering opportunities such as morning report, continuous education session, to train staff part by part,
- Visiting areas and provide on the job training
- Coaching during monitoring of 5S-KAIZEN activities

MoHSW trained all Regional Health Management Teams (RHMTs) and on the process training Council Health Management Teams (CHMTs). Therefore, hospitals in public sector should discuss budget allocation issues with RHMT or CHMT, and if budget is not enough, trained RHMT and CHMT can be technical back up.
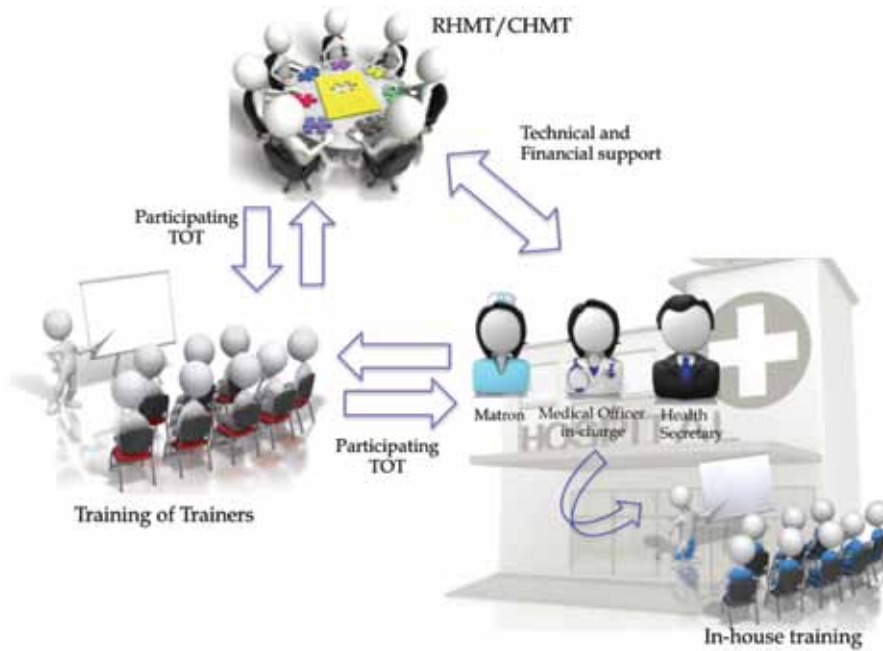
Diagram 2: Cascade training model and technical back up by local health authority

2.3. Outcome of the Rolling out

MoHSW has conducted several training on 5S-KAIZEN-TQM approaches to hospitals at all levels in both public and private since 2008. Total 56 health facilities are trained on 5S-KAIZEN-TQM as listed below. All Consultants, Specialized, Regional Referral and several District hospitals were trained on 5-S approach and basic knowledge on KAIZEN approach.

Additionally, all functional 21 RHMTs and CHMTs where district hospitals are practicing 5S were also trained on 5S to enhance 5S-KAIZEN-TQM activities at regional and district level. Moreover, MoHSW is planning to conduct more TOT to train newly upgraded hospitals to consultant and regional referral level.

Table 2: List of hospital got 5S training and implementing 5S activities (August 2011)

No.	Hospital	Level	Location
1	Mbeya Referral Hospital	Consultant	Mbeya
2	Kilimanjaro Christian Medical Centre	Consultant	Moshi/Kilimanjaro
3	Bugando Medical Centre	Consultant	Mwanza
4	Muhimbili National Hospital	Consultant	Dar es Salaam
5	Muhimbili Orthopedic Institute	Specialized	Dar es Salaam
6	Ocean Road Cancer Institute	Specialized	Dar es Salaam
7	Mirembe Psychiatric Hospital	Specialized	Dodoma
8	Kibong'oto Hospital	Specialized	Kilimanjaro
9	Songea Regional Referral Hospital	Regional Referral	Songea/Ruvu,a
10	Morogoro Regional Referral Hospital	Regional Referral	Morogoro
11	Tumbi Special Hospital	Regional Referral	Kibaha/Pwani
12	Iringa Regional Referral Hospital	Regional Referral	Iringa
13	Sumbawanga Regional Referral Hospital	Regional Referral	Sumbawanga / Rukuwa
14	Kitete Regional Referral Hospital	Regional Referral	Tabora
15	Singida Regional Referral Hospital	Regional Referral	Singida
16	Mbeya Regional Referral Hospital	Regional Referral	Mbeya
17	Bombo Regional Referral Hospital	Regional Referral	Tanga
18	Mawenzi Regional Referral Hospital	Regional Referral	Moshi/Kilimanjaro
19	Mount-Meru Regional Referral Hospital	Regional Referral	Arusha
20	Sekou-Toure Regional Referral Hospital	Regional Referral	Mwanza
21	Musoma Regional Referral Hospital	Regional Referral	Musoma/Mara
22	Babati Regional Referral Hospital	Regional Referral	Babati/Manyara
23	Shinyanga Regional Referral Hospital	Regional Referral	Shinyanga
24	Kagera Regional Referral Hospital	Regional Referral	Bukoba/kagera
25	Maweni Regional Referral Hospital	Regional Referral	Kigoma
26	Dodoma Regional Referral Hospital	Regional Referral	Dodoma
27	Sokoine Regional Referral Hospital	Regional Referral	Lindi
28	Ligula Regional Referral Hospital	Regional Referral	Mtwara
29	CCBRT Degignated Regional Hospital	Designated Regional Referral	Dar es Salaam
30	Tosamaganga Designated District	Designated District	Iringa
31	Mugana Designated District Hospital	Designated District	Bukoba/Kagera
32	Tandahimba District Hospital	Designated District	Tandahimba
33	Newala District Hospital	District	Newala
34	Masasi District Hospital	District	Masasi
35	Nachingwea District Hospital	District	Nachingwea
36	Amana Municipal Hospital	District	Dar es Salaam
37	Temeke Municipal Hospital	District	Dar es Salaam
38	Mwananyamala Municipal Hospital	District	Dar es Salaam
39	Siha District Hospital	District	Kilimanjaro
40	Kibosho Designated District Hospital	Designated District	Moshi / Kilimanjaro
41	Kilema Designated District Hospital	Designated District	Moshi / Kilimanjaro
42	Usangi District Hospital	District	Kilimanjaro
43	Mbulu District Hospital	District	Manyara
44	Kiteto District Hospital	District	Manyara
45	St. Joseph Hospital	FBO	Moshi / Kilimanjaro
46	Haydom Lutheran Hospital	FBO	Mbulu / Manyara
47	Hai District Hospital	FBO	Hai District/ Kilimanjaro

48	Machome Lutheran Hospital	FBO	Hai District/ Kilimanjaro
49	Huruma Designated District Hospital	Designated District	Rombo District/ Kilimanjaro
50	Same District Hospital	District	Same District/ Kilimanjaro
51	Gonja Lutheran Hospital	FBO	Same District/ Kilimanjaro
52	Dareda Designated District Hospital	Designated District	Babati District/ Manyara
53	Buma Hospital	FBO	Hanang District/ Manyara
54	Tumaini District Hospital	District	Hanang District/ Manyara
55	Mbalizi Designated District Hospital	Designated District	Mbeya District/Mbeya
56	Babati District Hospital	District	Babati / Manyara

Table 3: List of hospital got KAIZEN training and implementing KAIZEN activities (Novemebr 2012)

No.	Hospital	Level	Location
1	Mbeya Referral Hospital	Consultant	Mbeya
2	Kilimanjaro Christian Medical Centre	Consultant	Moshi/Kilimanjaro
3	Bugando Medical Centre	Consultant	Mwanza
4	Muhimbili National Hospital	Consultant	Dar es Salaam
5	Mirembe Psychiatric Hospital	Specialized	Dodoma
6	Kibong'oto Hospital	Specialized	Kilimanjaro
7	Singida Regional Referral Hospital	Regional Referral	Singida
8	Songea Regional Referral Hospital	Regional Referral	Ruvuma
9	Rukuwa Regional Referral Hospital	Regional Referral	Rukwa
10	Tosamaganga Council Designated Hospital	Designated District	Iringa
13	Mugana Designated District Hospital	Designated District	Kagera

Chapter 3:

Basic Concepts of 5S-KAIZEN-TQM

3.1 Quality and Safety in Health

3.1.1 Introduction

While hospitals are performing a valuable service to the public, stakeholders, including the public itself, are unsatisfied and complaining. This is because the services provided are not focused on the client's expectations and the services are not attractively presented to the clients. To this end, client remains with many unmet expectations.

Expectations that are not met include non-health expectations such as dignity, basic human needs, human rights, prompt attention in care and treatment[2], confidentiality, communication, autonomy, etc. Other unmet expectations are health expectations. Hospitals that fail to deliver these expectations express such failure as hospital accidents. These failures can be active failures when rules and procedures are violated at the site of treatment or action, or they can be latent failures created as a result of design failure, building failure and regulatory or policy failures.

3.1.2 Safety

There was shocking report came out from Institute of Medicine[3] in US in 1999, it is reported that errors cause between 44,000 and 98,000 deaths every year in American hospitals and over one million injuries. The biggest killers include:

- Hospital associated infections
- Drugs errors
- Patients accidents
- Communication problems
- Disorganized work environment

In Tanzania, the data on the burden of Hospital Associated Infections (HAI) is limited, as there is no systematic mechanism to study and collect the information. Therefore, we cannot say how many cases are occurring, and it can be imagined that there are so many medical errors and accidents happening in Tanzania. A recent article in the World Health Organization Bulletin (2011) puts the prevalence of HAI in Tanzania at 14.8%.[4] Therefore, necessity of research on this aspect to detect the extent of this situation is important.

The hospital industry is a hazardous industry. However, while the hospital industry has many employees of different job categories, involved in risky procedures to save patients and 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 and usually with less conflict.

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2   TASAF and Public Affairs Foundation, Bangalore, India. (2011). Citizen Report Card on District Hospitals in Tanzania.
3   The Institute of Medicine (IOM) released a report in 1999 entitled "*To error is HUMAN: BUILDING A SAFE HEALTH SYSTEM*"
4   Nejad, S.B., Allegranzi, B., Syed, S.B., Ellis, B. & Pittet,D. (2011). Health-care-associated infection in Africa: a systematic review. Bull World Health Organ; 89:757-765.

Hospitals appear to be far behind from other high-risk industries in ensuring basic safety. Hospitals should be Highly Reliable Organizations (HROs) as they handle human life under risky procedures.

HROs are organizations in which errors can have catastrophic consequences but which consistently avoid such errors. To accomplish this they conduct relatively error free operations over a long period of time and make constantly good decisions resulting into high quality and reliability. Examples of such organizations include aviation and airlines, air traffic control, and nuclear power plants. Could hospitals become the same? The answer is "YES", and it can be achieved through proper organization of the work environment in hospitals.

3.1.3 Characteristic elements of HRO's

The following points are considered as important characters to be HRO;

i.   HRO frequently audit the processes and procedures to make sure that they are correct, efficient, effective and pertinent.

ii.   HRO constantly do risk management by assessing the risk involved in all their undertaking and taking preventive and effective measures.

iii.   HRO avoid quality degradation by continuous quality improvement including adoption of new inventions.

iv.   HRO have a good system of command and control by having a system that assures good leadership, good decision-making process as well as effective monitoring and evaluation process.

v.   Employees in HRO are well motivated by the existence of a good rewarding system.

vi.   Migrating decision-making is made possible by the existence of clearly known protocols coupled with good communication system in the organization.

vii.   Back-up system is always in place and known to all pertinent employees in the organization.

viii.   Formal rules and procedures are in place and are observed. There is hierarch but this should be differentiated from the bureaucracy with negative implications.

Therefore to achieve quality and safety in health care, such characteristics of providing high quality services has to be attained by all health facilities. Where symptoms of poor quality are seen, it is impossible to provide services with safety.

To achieve high quality, systems used in implementation have to constantly be improved, for quality fails when systems fail. It is therefore important to take two steps in problem solving:

1)   **First step for problem solving** is to remove the immediate obstacle for patient care. However, only removing obstacle is not enough. If root cause of the problem is not thought and tackled with, there is a chance of recurrence.

2)   **Second step for problem solving** refers to system re-organization to prevent problem recurring.

There are some tools that are useful for monitoring of trend of problems such as control charts. Those tools will be explained in chapter 6 as "QC tools".

3.2. Strategic Management

3.2.1 Definitions

Management can be defined in several ways:

•   **Management:** - In the sense of managing it is synonymous to; control, supervision,

manipulation, handling, directing, administration, government, conduct, governance, operation, running, superintendence, command, guidance, stewardship (Oxford Thesaurus 1990)

- **Management** is the ability to go from point A to point B despite of; small deviations, fixed obstacles, moving obstacles, moving target, distractions, possibility of dead in the water – no fuel, possibility of going in cycles – no plan or map.

- **Management** is the ability to start, change or stop.

- **Strategic:** - Is an adjective synonymous to: tactical, key, crucial, principal, cardinal, and critical.

- **Strategic management:** - Therefore is the most effective and efficient way to start change or stop whatever we are or want to do.

  Strategic Management can also be defined as a joint operation of intellectual activities of planning and continuing exercise of work environment improvement, which leads to quality services and high productivity.

- **Total Quality Management** (TQM): - A comprehensive & fundamental rule or belief for **leading & operating** an organization aimed at continuously **improving performance** over a long term by focusing on **clients** while addressing the needs of all stakeholders.

3.2.2 Situations in developing countries

To run health facilities, resources are needed. These include financial, human, materials and infrastructure resources. It is commonly found in developing countries that both government health facilities and private health facilities are facing serious resource shortage.

There is a chronic shortage of government subsidy funds. Unavailability of sufficient health insurance cover to the population compounds the financial resource problem of the health facility. Cost recovery through cost sharing is insufficient. The number and skill mix of the health workers is insufficient. The infrastructure is dilapidated. All these chronic constraints lead to deterioration in efficiency & quality of services manifested by poor preparedness in the delivery of services, poor standards, poor or no increase of service packages, inequity in service provision and insufficiency in clients' satisfaction.

Empowering people to fight against poverty could ameliorate the chronic problems of funding health services. But while the problems are persistent with us, we, health workers, cannot stop providing services to the people, nor can we leave the problems unattended. The answer to this lies with how we manage the available resources and work environment.

3.2.3. Why do we have to manage our work?

The reason why we manage our work is to make our work easier so that we can enjoy life. However, in order to reach a situation where one has an active professional life; one has to have confidence in one self that in turn is only possible if one is able to gain respect from his/her clients and fellow workers.

Respect is achieved through professional competency. Professional competency is easily reached where the working environment affords minimal workload with maximal achievement, in a comfortable work place and a good teamwork.

Managing our work will lead to our enjoyment of life. One of the strategic entry points is the working environment improvement, which can easily be achieved by the implementation of the 5-S concept. The other strategic entry point is the implementation of the planning activities. These planning activities include strategic analysis, strategic choice, and strategic control. While there are various models of implementing the planning activities the most important and vital point is the need to always improve on what already exist leading to Continuous Quality Improvement.

Implementing working environment improvement together with intellectual activities of planning with "KAIZEN"activities will lead to acquiring the TQM framework thus enabling the provision of quality services and high productivity.

3.3 Health services and 5S-CQI (KAIZEN)[5]

3.3.1 What is 5S principle?

5S Principles are your reliable instruments to make a break-through in your work environment and staff attending various types of jobs in your institution. This is not only a concept but also a set of actions, which has to be conducted systematically with the full participation of staff serving the institution. 5S activities are practiced in a real participatory movement to improve the quality of both the work environment and service contents, which are delivered to your clients using the improved environment. It is used as a basic, fundamental, systematic approach for productivity, quality and safety improvement in all types of organizations.

Targets of 5-S principles are:

- Zero changeovers leading to product/ 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, i.e., client satisfaction
- Zero red ink, i.e., betterment of organization's image

Furthermore, introduction of 5S is expected to instill team culture, increase morale and motivation and improve job satisfaction. They are simple but effective methods to organize the workplace[6]. In the long-run implementation of the 5S principles also help in creating positive attitude to the workforce.

3.3.2 What is 5S?

5S is literally five abbreviations of Japanese terms with 5 initials of S. These are (i) Seiri, (ii) Seiton, (iii) Seiso, (iv) Seiketsu, and (v) Shitsuke. Convenient translation to English similarly provides five initials of S are; (i) Sort (ii) Set (iii) Shine (iv) Standardize (v) Sustain. Each "S" is explained briefly as below:

…………………………………………………………………………………………

(a) **Sort:** (Removal/ organization) = S1

Remove unused items for current work process from your workplace; and reduce clutter

(b) **Set:** (orderliness) = S2

Organize everything needed in proper order for easy work

(c) **Shine:** (Cleanness) = S3

Maintain high standard of cleanness of workplace, tools and equipment

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5   Prof. HANDA Yujiro, Moses SINKKALA. 2005. "Strategic Management and Continuous Quality Improvement (CQI (KAIZEN)) using 5S Principles"

6   Hirano and Talbot, 1995

(d) **Standardize:** (Standardize) = S4

Set up "Sort", "Set" and "Shine" as norms in every section of work place

(e) **Sustain:** (Discipline) = S5

Train and maintain discipline of health staff engaged.

To make 5S principle more familiar with health workers in Tanzania, translation and dissemination of 5S into "Kiswahili" is helpful. Kiswahili version of the 5S is as described in the box 1.

Five steps of Sort – Set – Shine – Standardize - Sustain is a sequence of activities to improve work environment in order to make it as convenient and comfortable as possible and thereby also improve healthcare and administrative service contents with regard to preparedness, standardization and timeliness.

How five steps of 5S activities will work is illustrated in the 5S conceptual framework, shown in Diagram 3. S1 to S3 are practiced first. Then see the progress, implement S4 activities to prevent fallback and equalization. Finally, implement S5 activity for long-term implementation.

Box 1: "Kiswahili" translation of 5-S

i.   **Sasambua** (Sort)

Ondoa vifaa vyote visivyotumika ofisini kwako.

ii. **Seti** (Set)

Weka katika utaratibu mzuri vifaa vyako ili kurahisisha upatikanaji wakati wa kutoa huduma.

iii. **Safisha** (Shine)

Dumisha usafi wa hali ya juu, pamoja na vifaa vya kazi katika sehemu zote za kutolea huduma.

iv. **Sanifisha** (Standardize)

Kusasambua, kuseti, na kusafisha kwa kiwango kinachokubalika iwe ni utaratibu wa kila sehemu ya kutolea huduma.

v.   **Shikilia** (Sustain)

Fundisha na dumisha tabia njema ya watoa huduma ya utekelezaji wa kusasambua,

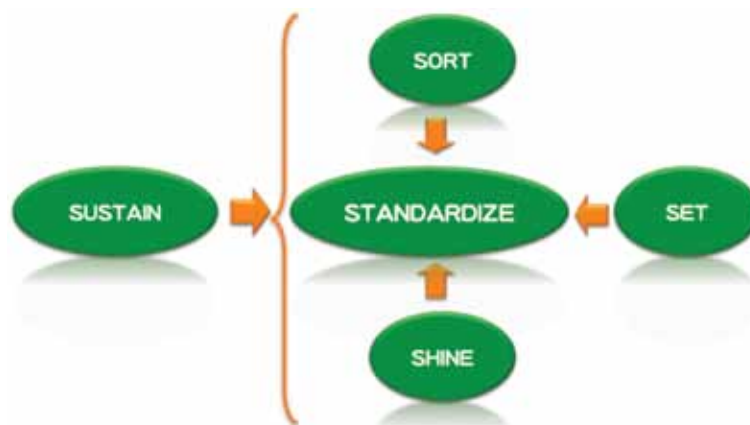kuseti, kusafisha na kusanifishailiiweendelevu.

Diagram 3: 5S Conceptual framework

Two different grades are identified in the standard of 5S activities in service sector particularly in health services. One refers to practice 5S for physical environment, and other refers to practice 5S for software matters such as: Job sequence and contents, Time management, Communication (meetings and briefings), and Standardization of patients care procedures.

If health facility management is strategically carried out, it will be able to reach the standard on 5S practices in software matters, and possible to tackle with technical aspects of the health care for the betterment.

3.3.3 Setting 5S targets for health facilities

All type of health facilities is the typical target of 5S, since these systems are rather complicated and difficult to maintain for delivery of various services in the obtainable best condition. There are divisions, as implementation units (clusters), which need to have respective objectives, as an essential functional component of the institution. Many QI approaches are not considering the units providing backyard services. 5S targets all divisions in health facility to built foundation of quality services. Table 4 gives some examples on divisions and expected outcomes.

Table 4: Examples on divisions and expected outcomes

Divisions/ Sections	Expected outcomes/targets of routine work
Security guard office	The facilities are protected from outside environment.
Kitchen	The area is clean, safe and well organized. All machines are functioning. Foods supplied to in-patients are safe, nutritious and tasty.
Laundry	The area is clean, safe and well organized. All machines are functioning to produce clean lines.
Maintenance technician's office	The area is organized and tools, materials and spare parts are well kept. Equipment are all in good function.
Pharmacy	All medicines are managed and stored. Supplies are done just in time and no stock out or over stock. Medicines are delivered to the clients precisely.
Laboratory	All tools and machines are functioning, and regents are available for all laboratory tests. Standardized and quick laboratory tests are available, and release results swiftly.
OPD	Less waiting time at reception. Vital signs are measured before consultation. Outpatients are nicely treated with minimum waiting time.
Patient Wards	Nurse station is well organized, toilet and other ward's facilities are clean, and inpatients receive treatment under comfortable environment.
Labor room	All equipment and tools ready for delivery. Normal deliveries are conducted in a safe, clean and efficient system.
Operation Theatre	The area is clean and safe. All equipment is functioning and well organized. Surgical care is given under a safe, clean and efficient system.
CSSD	All machines are functioning to clean and sterilize tools and materials. Supply and sterilization system supports the safety and cleanliness .
General store	All items are managed and stored in clean environment. Supplies are done just in time and no stock out or over stock.
Room for doctors	The area is clean and organized. The utility provides staff relaxation and readiness to work.
Administrative office	Files and papers are organized.
Matron's office	Office works as the management Centre for nursing in-charge.
Hospital Doctor's Office	Office works as the center for decision-making and management.

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

The workload should be moderate under the stimulating working condition to allow the staff to be innovative in developing various ideas or proposals for the betterment of the jobs, procedures and the outcomes. It is, however, not easy to realize the above situation in reality. In the real setting, health managers and workers have to attend many patients, lots of paper works, complexity in reporting system are often seen in workplaces.

These areas are all targets of 5S activities. By the continuous actions of Sort-Set-Shine-Standardize-Sustain, it is possible to reduce workload; make maximal use of given working hours to provide services to both external and internal clients; and in addition, you will be able to have an extra cup of tea in the tea time, because the system becomes lean and maximally efficient.

First step is to sort necessary and unnecessary items in your workplace, and unnecessary items need to be discarded or relocated where needed. Then, arrange the essential items according to workflow. Then make workplace and tools shining by daily cleaning and also standardize the process of Sort-Set-Shine successfully. In the process of the standardization, health workers acquire good attitude to be in driver's seat of 5S and KAIZEN activities to sustain and improve Quality of health services in health facility or hospital.

Note that detailed procedure of 5S activities will be explained in Chapter 4.

3.4   KAIZEN[7]- Continuous Quality Improvement

3.4.1   What is Continuous Quality Improvement (CQI)?

It is a process to secure "Productivity" of our work. This is a non-stop, day-to-day process to improve the standard of work, followed by all members of the workforce for achieving the best in outcomes and outputs of health service.

CQI is a sequence of actions as mentioned above. In addition to that, it is a "Means of Monitoring" as well. CQI itself has a function to monitor the on-going work and task given to each cluster of the system with PDCA cycle, explained in Chapter 4.

In a health institution, for example, CQI can monitor the performance of each section of the hospital ranging from hospital director's office to patient wards. The major TOOL for the initiation of CQI process is 5S, which is elaborated in Chapter 4 (implementation of 5S-KAIZEN-TQM)

3.4.2   The first challenge in KAIZEN towards "Quality of Service"

Betterment of your work environment is the first challenge in "KAIZEN" or Continuous Quality Improvement. Without a well-organized place for work, we cannot provide well-prepared, standardized, and timely services with proper communication with our client, which means that we cannot reach the standards of quality of service.

The entry point of KAIZEN should be as follows:

1)   Work environment is not an entity only with physical environment, such as building, equipment, and instruments.

2)   It includes functional aspects of your working place, such as personnel team, meetings, recording/reporting system, time arrangement for work and communication system among staff and external counterparts.

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7   Prof. HANDA Yujiro, Moses SINKKALA. 2005. "Strategic Management and Continuous Quality Improvement (CQI (KAIZEN) using 5S Principles

3) Environment often defines the behavior of the people. Your workforce is not an exception. If the physical structure and other in-house facilities are comfortable to them, their physical and psychological stresses are much reduced. They fulfill their work easily and efficiently.

4) On the contrary, under unfavorable and inconvenient work environment, where they have to use extra energy to overcome the inconvenience, people's willingness to the work naturally deteriorates.

3.4.3 How to arrange the user-friendly and convenient working environment?

There are so many questions, which have to be answered.

•   Do you think that your work places are good enough to motivate you to work?

•   Are you satisfied with the present situation and environment of work?

•   Are you sensitive enough to detect inconvenience to yourself and your staff?

The responsibility of a manager includes the arrangement of the obtainable best work environment for the teammates and staff. Now we have to discuss a feasible approach for us to uplift the work environment. One approach that we can employ is called KAIZEN in Japanese language or Continuous Quality Improvement. The instrument for the initiation of this approach is 5S principles.

3.4.4 What is KAIZEN?

KAIZEN is a Japanese word, which has meaning of "change for the better". In Japan, "KAIZEN" is used for the actions of making situation, products, or services better for meeting needs and expectations of customers.

改 善

KAI   ZEN

"Change" and "Improvement"

=

Change for the better

KAIZEN is a process of CQI by means of a non-stop process to uplift the standard of your work environment and services contents to the obtainable best condition and maintain it as user-friendly and convenient as possible. KAIZEN has to be practiced by all categories of staff including the management team. Top management is not an exception and should participate in the process. For top management of a Project or an Institution; and for activities, including community-based health services, it is crucial to make this process a "Movement or Campaign" within the organization as a management target.

KAIZEN is an approach developed in manufacturing sector in Japan around 1960's to improve the productivity. Imagine a factory manufacturing vehicles. There, over 2500 parts are prepared, standardized and supplied timely for the assembly process of one vehicle. There is also a workable communication system among different sections and offices to control the production process.

The production line is perfectly in order since they have to assemble the 2500 parts precisely on time having their outcome target of finalizing 5,000 vehicles per day. Each assembly process and maneuver of workers should be in the achievable best level. The issue is to reduce the number of products, which are rejected at end products final evaluation. If there are many rejected items, the company loses money. It also negatively affects the quality of vehicles and finally loses in the competition in the market.

Quality of the end product, which is handled by various groups of people (production units), cannot be maintained, if there is no mechanism, by which all production units seek higher quality of work throughout the on-going production process. It is this concept, which KAIZEN seeks to achieve in the provision of health services in the hospitals and other health facilities.

3.4.5 Health service and KAIZEN

Health service is also an outcome of a complex process, as in the case of car industry, requiring "Quality of Product". This "Product" is "Health service" as you have already learnt in the previous chapters.

Health service is also handled by various groups of people. Therefore, you, as managers of health service, are the persons who have to strengthen internal mechanism of your organization to involve all staff in the movement to promote Continuous Quality Improvement. This is "KAIZEN".

Specific targets for KAIZEN have to be given by top- and /or middle-level management staff to all divisions or implementation units at health facility.

We need a situation, where every division always look into the potentiality of making the job easier, more effective and more efficient within the given circumstances by mobilizing their capacities to create new ideas. Small ideas sometimes initiate efficiency and effectiveness. Ideas from the workforce have to be considered by the top management (bottom to top uptake of ideas).
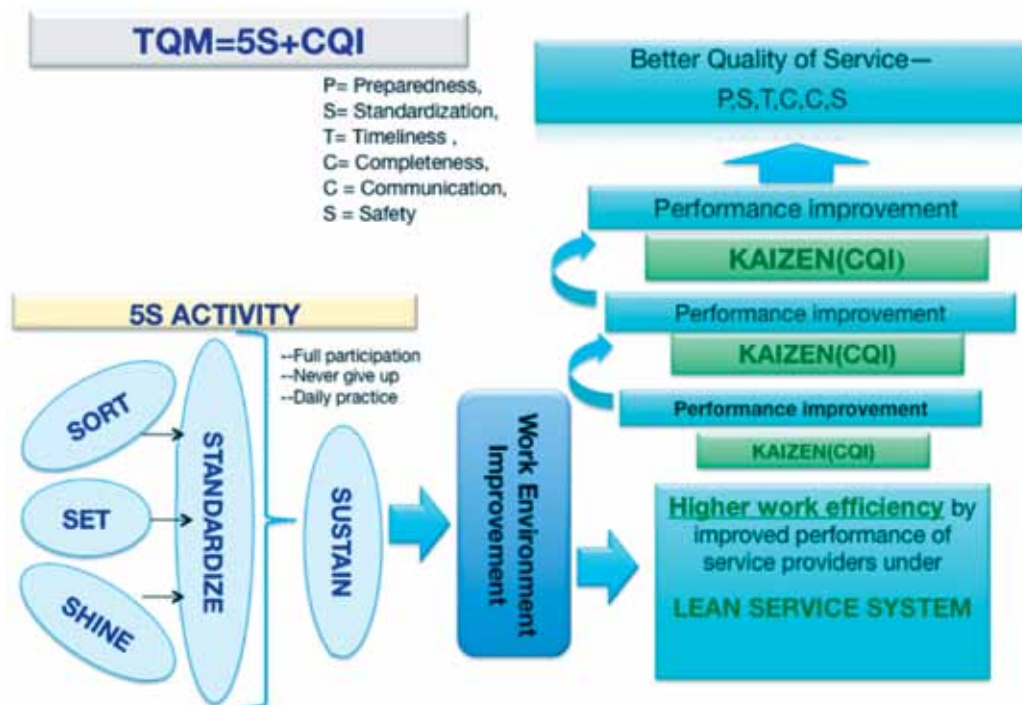
Diagram 4: 5S-KAIZEN-TQM Frameworks

3.4.6. Other important concepts for productivity improvement

3.4.6.1. Seven Wastes

In the explanation of Lean Thinking, "Waste-elimination "was mentioned. The word "waste" often misunderstood as "medical wastes "or other material wastes. However, that is not true and many wastes are hidden in our work process.

Former president of TOYOTA, Mr. Taiichi Ohno thought and advocates that there are seven wastes in any type of business, which does not produce added value. Those are;

1. Overproduction: keep patients unnecessary for observation, very high speed laboratory equipment with less specimens.
2. Inventory: Overstock and redundant of medicines, medical supply in section or store.

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3. Transportation: Unnecessary movement for delivering medicine from central store,

4. Motion: Looking for something or someone (files, equipment, tools, and staff) and move 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.

Diagram 5: Seven wastes unproductive

Those wastes are called "MUDA" in Japanese. There are two more things need to be eliminated by 5S-KAIZEN-TQM activities for improvement of hospital management and quality of health care. Those are; "MURA" (Waste of unevenness) and "MURI" (Waste of overburden)

English	Japanese	Explanation
Overburden	"MURI"	Any activity asking unreasonable stress or effort from personnel, material or equipment. It means too heavy a mental or physical burden
Unevenness or inconsistency	"MURA"	Any variation leading to unbalanced situations. Mura exists when workflow is out of balance and workload is inconsistent and not incompliance with the standard
Waste/wastage	"MUDA"	Seven wastes mentioned in the above. Any activity or movement in work process that does not add value. It is also not creating value for the customer

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8   http://www.makigami.info/forum/index.php?topic=2.0

Note that "MURI", "MURA" and "MUDA" are usually observed together. When a work process is imbalanced (means "MUDA"), it causes overburden on equipment and staff (means "MURA"), which will cause all kinds of activities that do not add value.

3.4.6.2. Just In Time (JIT)

"Just in Time" concept was developed and perfected by Taiichi Ohno, former president of Toyota Corporation during 1960s and 70s to meet fast changing consumer needs and demands with minimum delays.

"Just in Time" is a strategy that used in inventory management. As mentioned in the above, "Inventory" is one of the seven wastes and needs to be eliminated. With the JIT strategy, organization aims to reduce wastes of stocks and inventory costs by receiving items only when they are needed to produce services. JIT inventory management thus increases efficiency, and is used by organization that prefers to keep low inventory level.

JIT strategy can also be applied in health facility. For example, thousand of medical supplies and medicines are used in a hospital. Unfortunately, overstocks and redundant of medical supplies are often seen in both ward and store. Too many stocks and redundant of items will suppress procurement.

Another example, in Central Sterile Supply Department (CSSD), different operation kits are assembled and sterilized, and stored. However, if those kits are unnecessary assembled and sterilized, not utilized and kept for a while, those are must be sterilized again. This is a waste and need to be reduced.

Chapter 4:

Implementation of 5S-KAIZEN-TQM

4.1 Implementation of 5S-KAIZEN-TQM activities

4.1.1. Introduction

In this chapter, actual implementation of 5S and KAIZEN activities are explained in details.

Implementation condition of 5S activities is believed to reflect moral and management level of an organization. If staff has developed a feeling of subordination under the organization, staff will take care of infrastructure, equipment, tools etc. and work place will be automatically well organized, clean and systematic. However, change management of a system is bound to be difficult and complex in any organization.

Implementing a quality improvement system often faces difficulties due to deficiencies in leadership, support and motivation of management and staff, information management, organizational structure, and culture (e.g. team work, learning orientation).

It is necessary to create good working environment for making for both internal and external clients satisfy. However, one-way communication from top to bottom only will not be able to improve working environment as the mind set of health workers is not going to change easily.

Therefore, big attitude change and mutual effort by both management and other health workers are necessary to improve working environment. This can be achieved through utilization of a mixture of top to bottom and bottom to top approaches shown in diagram 5 " 5S implementation structure".

Implementation of 5S activities should not be onetime or short-term event. It is better to make it as a culture of the hospital so that sustainability of 5S activities will be high. To make 5S as a culture of hospital, it is necessary to clarify how work place and environment should be organized, and share the image to all staff.

Diagram 6: 5S implementation structure

Note that what we need in implementing 5S principles is: little knowledge, little hard work, little dedication and a very big positive attitude!

For success in implementation of 5S activities:

1. There should be continued commitment and support by top management

2. Five-S (5S) implementation should start with education and training of all health workers

3. There are no observers in 5S, everyone must participate in 5S activities

4. Practice 5S cycle (Sort-Set-Shine-Standardize-Sustain) daily in order to achieve a higher standard

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4.1.2 Phases of 5S Implementation

5S is usually implemented gradually - often over a one- or two-year period of time. The following implementation phases and duration of each phase are recommended for effective and efficient implementation of 5S-KAIZEN activities. There are 4 phases to implement 5S activities, namely, Preparatory phase, Introductory phase, Implementation phase, and Maintenance phase. The details of each phase are shown in table 5 and diagram 7.

The phases of 5S implementation should be considered carefully at the time of developing action plan. Inserting many activities in the first two phases (Preparatory and Introductory) will delay the implementation process. Starting from selecting few target areas and prioritize activities for each targeted area according to the phase of 5S implementation leads to successful and sustainable implementation of 5S activities.

Table 6: Phases of 5S implementation

	Phases	**Approximate time period**	**Example of activities**
1	Preparatory phase	Three months	Dissemination, Management level training, QIT formulation, Situation analysis, Target area(s) selection
2	Introductory phase	Six months	Staff level Training, WIT formulation, Sorting-Setting-Shining activities
3	Implementation phase	Two years	Ongoing monitoring, Standardizing activities
4	Maintenance phase	On going	Refresher training, Awarding
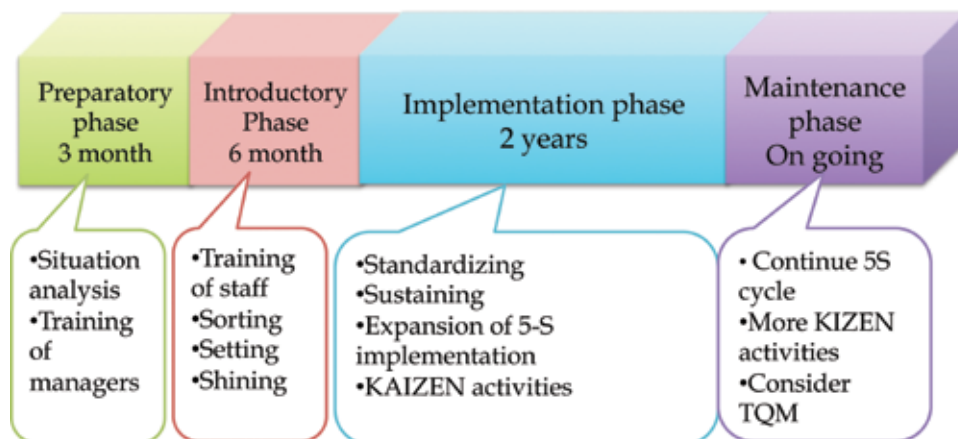
Diagram 7: 5S-KAIZEN-TQM implementation phases

There are 10 steps for implementing 5S activities. From Step 1 to Step 5 are under Preparatory phase. From Step 6 to Step 8 are Introductory phase, Step 9 is under Implementation phase, and Step 10 is under Maintenance phase.

In each step, there are many activities to complete for next step. The 5S-KAIZEN-TQM activities flow chart is illustrated in Diagram 8.

The Maintenance phase is an on-going phase hence the phase has no time limit. However, it is expected that within three (3) years of entering this phase, all necessary structures for implementation of QI program and accountability systems should be in place. All health workers (staff) will be shaped to follow workplace rules and habits. S1-S4 will be the culture of all staff and the facility management.
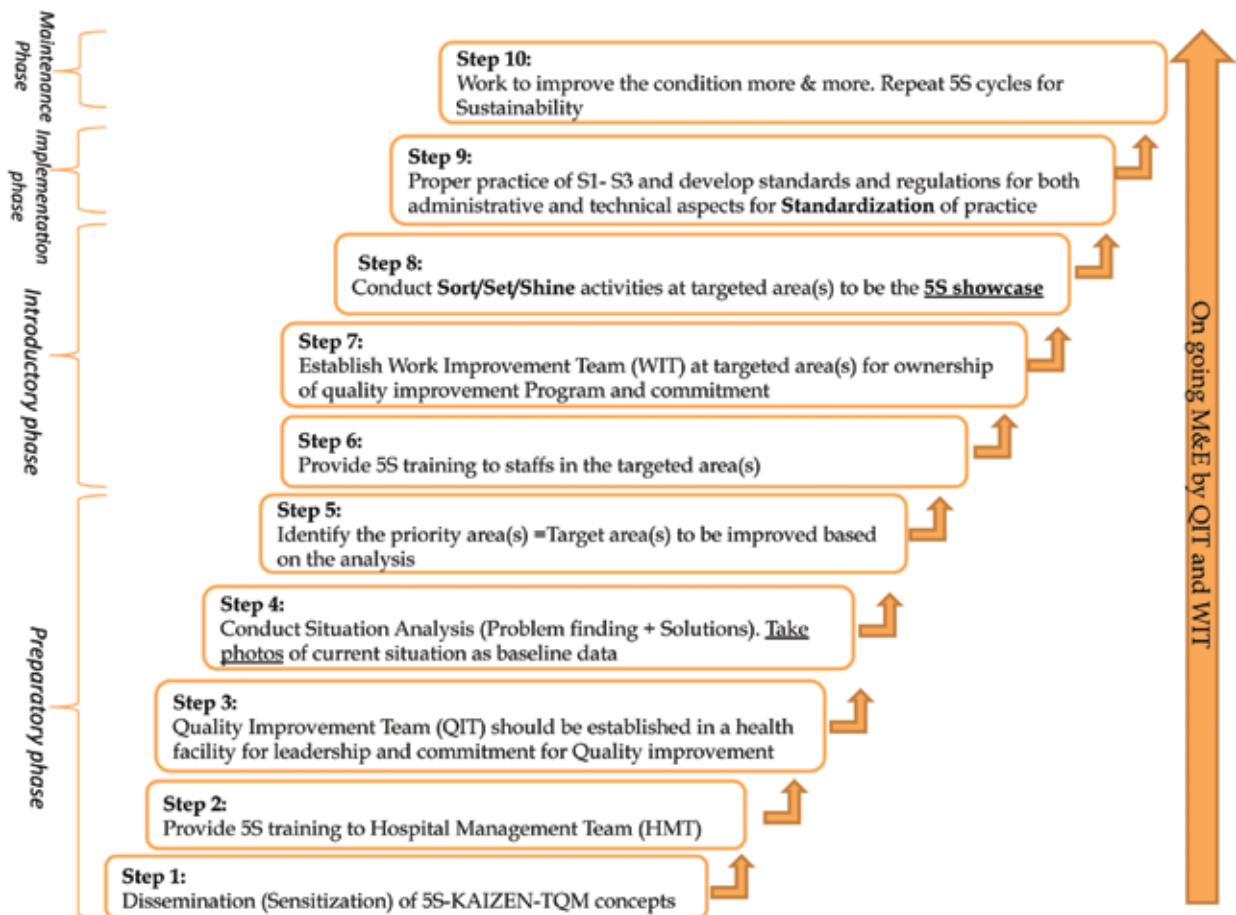
Diagram 8: 10 steps for implementation of 5S activities

4.1.3 Implementation steps of 5S activities

Preparatory Phase

The aims of this phase are to make managers understand and adopt 5S-KAIZEN-TQM concepts and establish structure of 5S implementation. It is important to know "where and how you are" by conducting situation analysis. Time required for this phase is approximately three (3) months.

Step 1: Dissemination/Sensitization of staff of 5S-KAIZEN-TQM concepts

As stated in the above, 5S activity starts with "education". All staff in your health facility can be targeted for dissemination of 5S-KAIZEN-TQM concepts.

At the time of dissemination/ sensitization, true meaning of 5S must be conveyed to everyone. 5S is often incorrectly characterized as "standardized cleanup", however it is much more than

cleanup. 5S is a philosophy and a way of organizing and managing the workplace and work flow with the intent to improve efficiency, safety and productivity by eliminating waste, improving workflow and reducing process unreasonableness.

The following points should be emphasized to convey the actual meaning of 5S activities during the sensitization session:

- 5S activities is the foundation of all quality improvement programs
- 5S activities will improve working environment by elimination different kinds of wastes
- 5S activities will help managers and health workers to manage workplace, which leads the improvement of productivity and safety
- 5S is not in conflict with any other quality improvement approaches that are already introduced in the Tanzania Health Sector
- 5S is not a one-time event. It should be practiced day by day and make 5S as a culture of the health facility. Periodical training is necessary for both management and department/ section level for sustainability

Step 2: Training for Management level staff

Based on the different studies and experiences from organizations introduced 5S activities, it is found that "Strong leadership and commitment" is a key for successful and sustainable implementation of 5S-KAIZEN-TQM approaches.

During training of managers, the concepts of 5S-KAIZEN-TQM must be well understood and adopted by the participants. The steps of 5S-KAIZEN-TQM activities implementation must logically be lectured.

The following contents need to be focused during the management level training;

- Basic concept of 5S-KAIZEN-TQM approaches
- How to conduct "Situation analysis"
- How to establish Quality Improvement Team (QIT) and its roles and responsibilities
- Action plan development and integration of the action plan into hospital operation plan
- How to establish Workplace Improvement Team (WIT) and its relationship with QIT
- Self -monitoring and evaluation of 5S activities
- How to organize in-house training (education of staff)

Note that it is better to develop implementation plan for 5S activities at the end of the manager training.

Step 3: Formulation of Quality Improvement Team (QIT)

After the training of the management level, it is recommended to establish a team that will take lead and responsibilities for implementation of quality improvement activities. Team formulation for quality improvement is clearly stated in Tanzania Quality Improvement Framework (TQIF) 2011-2016; *Chapter 5: Organizational structure for Health Care Quality Improvement, all public hospitals are instructed to establish a team called; Quality Improvement Team (QIT).*

Hospital Management Team should select members of QIT among staff.

Establishment of QIT will help to accelerate decision-making, implementation QI activities and increase commitment for quality improvement in the hospital.

Main roles of QIT are as follows:

- To oversee all QI activities
- To train hospital staff on 5S-KAIZEN-TQM
- To conduct situation analysis
- To implement 5S-KAIZEN activities for common problems of the hospital
- To conduct periodical self-monitoring and evaluation
- To provide technical advice to WITs
- To record, coordinate and integrate all QI activities conducted in the hospital
- To review situation and the action plan
- To provide necessary input for 5S-KAIZEN-TQM activities
- Provide progress report quarterly to HMT, CHMT/RHMT and MoHSW

Step 4: Execution of Situation Analysis before 5S activity

Situation analysis is very important activity to know what is the current situation of your health facility. This will be the baseline of QI activities.

Moreover, problems existing in the health facility are also identified through Situation analysis.

After establishment of QIT, this is the first activity that QIT conducts. When QIT conducts the analysis, QIT must be equipped with digital camera, and take pictures of working environment in all departments, sections, and units within the health facility, including back yard services such as kitchen, laundry, store etc. Pictures of hospital environment such as entrance, parking, waste dumping point, garden, patient waiting area, should also be taken.

Those photos must be recorded as baseline (before 5S). These are useful for comparison and to measure the progress (before-after comparison) of 5S activities. While taking pictures of working environment, the following points of the picture need to be captured;

- Equipment and furniture arrangement,
- Tools and supplies storage in the store area, inside cabinet, drawers etc.
- Sluice room and storage of cleaning tools,
- Working bench
- Trolleys
- Waste bins

Note that positions of photographing must be recorded for the next visit to monitor progress of 5S activities.

Not only taking pictures but also observation and interview from staff are also important methodology for situation analysis. After compiling the findings from situation analysis, the findings must be shared with sections /units in-charge and staff. This will help them to understand "how your working environments are". Moreover, situation analysis results should be reflected to the action plan.

Step 5: Selection of Target area(s)

Selection of target area(s) is highly recommended for successful implementation of 5S activities. Based on the past experiences, the health facility, which consider "equity" too much and rollout 5S activities all over the facility, failed to implement 5S effectively.

Proper implementation of 5S activities at targeted area(s) is to make "showcase" (model of 5S), which helps to make staff understand "what is 5S about" smoothly (i.e., seeing is believing!)

When select the target area(s), DO NOT select sections or units that are facing lots of problems as it will take long time to solve the problems and difficult to make them as a "showcase".

Number of target area(s) can be decided according to the capacity of QIT and resource availability. Many hospitals in Tanzania select 3 to 5 areas as showcase in the beginning of "Introductory phase".

Criteria of target selection are described in the box below.

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Criteria of target selection will be:

- There is someone who has commitment to implement QI Program in the section

- Situation of section/department need to be improved for better customer care; and

- Section/Department is facing fewer problems or the problems are easy to tackle.

</div>

Once 5S is successfully introduced to the targeted area(s) and mechanism to sustain the activities is in place, expansion of target area(s) can be executed.

Introductory Phase

The aims of this phase are to make staff understand and adopt 5S-KAIZEN-TQM concepts and implement 5S activities. It is important to know "How to practice 5S activities" and responsible team establishment at section or unit level. Time required for this phase is approximately six (6) months.

Step 6: Training all Staff

As noted in section 4.1.1, one of the key factors for successful 5S implementation is "everyone's participation". Therefore, training of all staff at targeted area(s) is essential. During the training, the following contents should be focused:

- 5S-KAIZEN-TQM concepts
- Situation analysis method for department/section level
- 5S tools and their application
- Establishment of Work Improvement Team (WIT)
- Development of action plan for department/section
- Self monitoring and evaluation

Step 7. Work Improvement Team Establishment

A team is defined as a group of people working together to achieve a common goal for which they share responsibility. It can also be defined as a high performing task group whose members are interdependent and share common performance intent.

Workplace improvement teams (WITs) are essential employees-based small group activities.

Aim of WIT establishment is to provide staff with opportunities for meaningful involvement and contribution in the process of problems solving and challenges. Ideally, WIT meet regularly to identify, analyze, and solve problems and improve outputs of their work unit. They also implement improvement measures or recommend identified countermeasures to management. The bottom line outcome of WIT activities includes higher quality outputs and productivity improvement.

Formation of WITs essentially necessitates pursuing several steps that are: forming, storming, performing and closing. The norms of the team generally consist of:

- Close relationships developed and the team demonstrating cohesiveness

- Team group rules and boundaries agreed

- Cooperation

- Team identify and member enjoy camaraderie (fellowship/peer consciousness) with one another and

- Commitment to work out differences and giving constructive feedback

The team meeting should be conducted regularly as per schedule and minutes of the meeting including the attendance record of the participants should also be kept properly and appraised regularly (see Diagram 9 on how WIT operates).
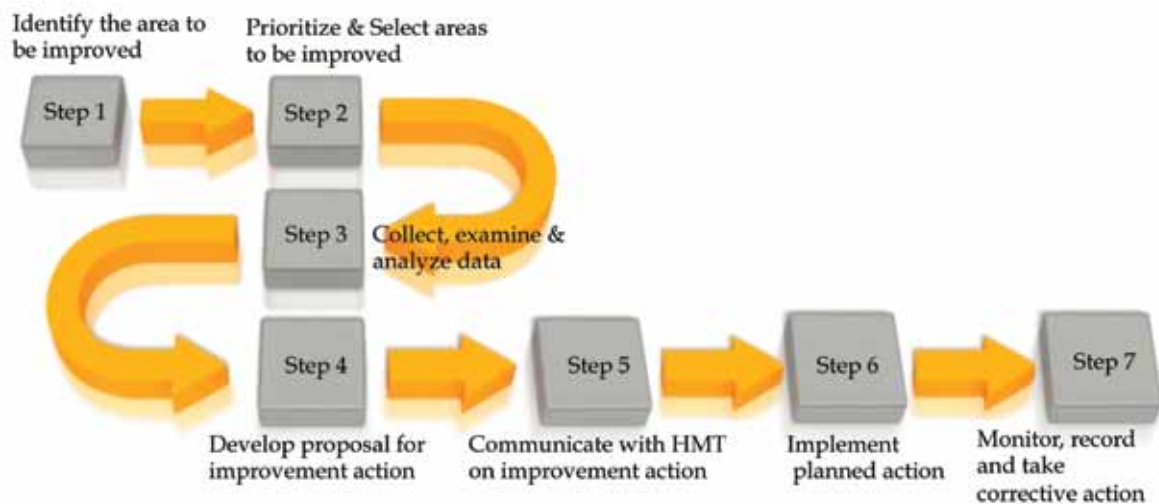
Diagram 9: How operate WIT in hospital

Throughout WIT regular meetings, the tips are usually underlined. Some of the tips for of effective team meeting to take into account include: meeting agenda prepared in time and distributed to the members, time management and maintaining focused discussion, and encouraging and supporting participation of all members.

Amongst the areas which WITs seek to effect qualitative improvement includes; services to the customer /public, workflow, efficient use of resources, work environment and safety.

Benefits of working as a team comprise of: sharing of the knowledge, skills and experiences of different members which builds confidence among the members and collective decision making; sharing responsibility; tackling issues in synergistic manner; and there is also mutual support and cooperation between team member, thus in the end accomplish quality improvement.

Teamwork is vital in achieving continuous quality improvement. Usually the teams take a problem as an opportunity and the team members support each other. It should be remember, "One big tree does not make a forest!"

Step 8. Practice of Sort, Set and Shine

Practice of Sort (Seiri) is starting from identification of unwanted items in the work place. It has to be initiated by disposing all that are no longer needed after identification of unwanted items through red tagging (see Chapter 5.0: 5S tools). Simple way of Sorting is to categorize all equipment, machines and furniture into three (3) categories by using colors. These categories are; Unnecessary (not need it), May/May not be necessary (May not need), and Necessary (Need it) as depicted in Diagram 10.

Unnecessary (Not need it):

Unnecessary items should be discarded, if the item is not repairable. If the item is repairable, repair it and store, as it may be needed by other department/sections or other hospitals.

May be necessary/May not be necessary (May need it/May not need):

May/May Not Necessary items mean that the items are not used often (probably only once a month) or it is functioning but not used in current workflow. This kind of items should be stored in sub-store of department/sections so that it can be taken out quickly when it is needed.

Necessary (Need it):

Necessary items should be organized properly according to current workflow. This will be explained in "setting" activities
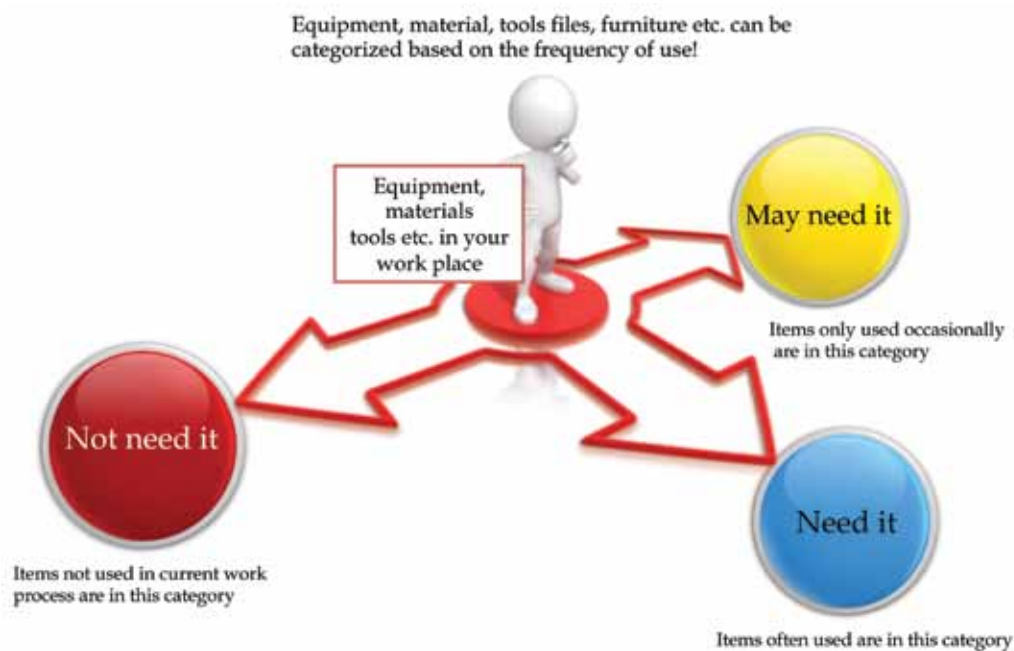
Diagram 10: How to Sort materials/items/tools

Remaining items have to be arranged and stored according to frequency of use. All areas including floors, cupboards and tabletops have to be organized. The changes made have to result in more efficient work than before.

When unwanted items are collected from various departments/sections, the following things must be recorded and filed for smooth discarding procedures:

1)   Name of items

2)   Inventory number,

3)   Where it was,

4)   Where it will be stored

"Unwanted items store" should be established and all unwanted items properly stored in until you complete discarding process. If sizes of unwanted items are large and not repairable, space for unwanted items should be created within hospital compound with safe storing measures. Rules for regular disposal have to be established.

After practice of "Sorting exercise", only necessary items remains in workplace. Then, next step is practicing "Setting exercise" Practice of Set (Seiton) emphasizes on proper orderliness of things in the work place. When organize the necessary items, workflow must be considered well to

make your work easier and reduce unnecessary movement ("Transportation" is one of the seven waste to eliminate). All necessary items should be arranged by using "Can see – Can takeout – Can return" Philosophy.

Signboards are set at the entrance for easy access of various services locations in the health facility. All locations are named or numbered. Every item has to be labeled with an inventory number (discretely) and assigned a location. Visual controls including color-coding are practiced. Files and cupboards are indexed. X-axis-Y-axis alignment is practiced in the positioning of items.

Note that above-mentioned activities in "Setting practice", 5S tools are very helpful to organize necessary items with proper workflow. Application of different 5S tools will be explained in Chapter 5.

Next step is "Shining exercise". Practice of Shine (Seiso) is the cleaning of workplace and maintenance of tools and equipment. Floors, walls, windows of all areas in workplace and all equipment, tools furniture etc. need to be cleaned. Appropriate cleaning tools must be used and well stored. Waste bins for different purposes should be available.

Cleaning maps and schedules with responsible person should be developed for continuous practice of cleaning waste bins. Color-coding for segregation of wastes must follow the national standard color-coding in the healthcare waste management (HCWM) guidelines; as well as the National Infection Prevention and Control guidelines of the MoHSW.

Implementation Phase

The aims of this phase are to practice S1 to S3 properly and generate maintenance system for S1to S3 (standardization: S4) in many areas of health facility. Time allocation for this phase is approximately two (2) years.

Step 9: Proper practice of S1 to S3 (Sort, Set, and Shine) to generate maintenance system, develop standards and regulations

After completion of two phases, QIT need to consider expansion of 5S implementation areas and try to cover all sections and units within two years.

Increase number of implementation areas in health facility might reduce frequency to visit 5S-implementing areas for mentoring and coaching of staff. This might cause fallback of 5S practices. Therefore, it is important to standardize and prevent fallback of 5S activities in the facility.

Standardization (Seiketsu in Japanese) needs to conduct the following things:

(i)   Implementation of activities on regular/continuous basis,

(ii)   Use of checklists for each service/activity,

(iii)   Equalization (heijyunka in Japanese)

Standardization establishes regular and continuous practice of maintaining tidiness, orderliness, and cleanliness (S1 to S3). All processes and procedures of the organization are standardized to reduce the cycle time, to reduce waste, to improve safety and to improve outcome. Thus, the following kinds of activities are implemented in this phase:

- Development of Standard Operating Procedures (SOPs),
- Display marking of safety signs
- Garbage typing collection system (infectious/non-infectious, recyclable), following the IPC/HCWM guidelines
- Color coding for linen system
- Zoning for storing/parking equipment

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"Checklists" should be developed for each activity/service area and utilize it for the standardization.

As mentioned in the above, equalization, "heijyunka" is a part of S4 activities. Heijunka refers to a "Production leveling" and "Production smoothing" technique generally employed for scheduling of service activities in order to control inventory, decrease lead times and produce a mix of services and in appropriate volumes as per the client needs.

For example, OPD clinic of a hospital is very busy in the morning hours and workloads of health staff heavy in the morning hours. However, there are few patients in the afternoon and some staffs are not attending patients. This variability of services is not productive and does not meet external clients needs as waiting time get long, and consultation time gets short etc.

Therefore, it become a target of "heijyunka" to leveling workloads of staff,

Variability is the cause of creating needless work in the workflow. Therefore, the following issues need to be considered for equalization;

- Individual capacity,

- Quality, Productivity and Safety,

- Information

- Staff's mindset towards KAIZEN activities.

These aspects can be equalized using various tools as mentioned below:

Individual capacity:

Information sharing and development of Standard Operating Procedures,

Quality, Productivity and Safety:

Use of Standard Operating Procedures

Staff's mindset towards to KAIZEN activities:

Fair performance evaluation and awards to good practice, equal opportunity of training to all staff,

Information:

Sharing among staff of policy and strategy for quality improvement and current situation of KAIZEN activities
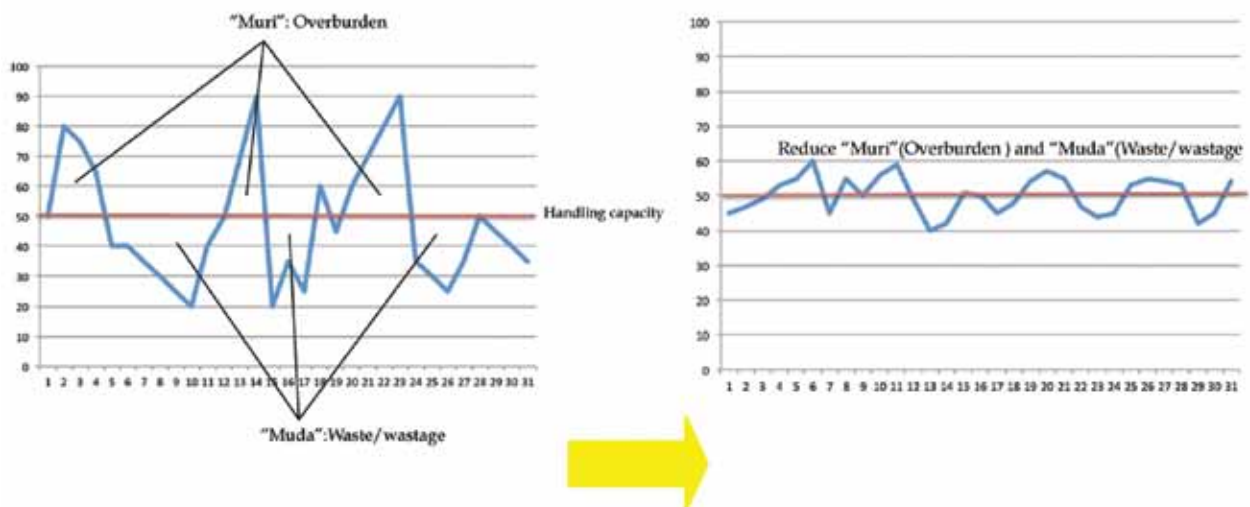
Diagram 11: illustration of "Heijyunka"

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Maintenance Phase

The aims of this phase are to maintain staff to follow good work habits and keep workplace rules and regulations. To make 5S activities as a part of organization culture, it takes long time and need to be repeated. There is no specific time allocation of this phase as it is on going process.

Step-10. Making 5S activities a culture of your facility

Sustain (Shituske) is about disciplining to maintain consistent practice of 5S.

It denotes commitment to maintain orderliness and to practice the S1 to S4 as a routine of work. Continuation of "good habit" is supported with the following activities:

- Remind on good practices by management, subordinates, and client of your services
- Orientation of 5S-KAIZEN-TQM for newly employed staff
- Refresher training program for employees
- Recognition and awarding of good practices, good ideas with facility
- Periodical HMT-QIT meeting and QIT-WIT meeting

The following activities are expected be conducted in this phase:

- Periodical monitoring and coaching of staff by QIT
- Biannual self-evaluation and feedback
- Biannual external evaluation and feedback
- Quality competitions and awarding for good practice
- 5S poster development and display
- Establishment of 5S corner within department/section
- Display of 5S progress chart, table, and graphs

After Step-10, KAIZEN process starts to meet client's satisfaction.

Productivity and safety must be considered in the process of KAIZEN. However, even though step up to KAIZEN process, 5S activities must be continued to maintain the level of S5 as it is precondition of KAIZEN activity.

The KAIZEN framework is illustrated in Diagram 12. KAIZEN teaches solving problems, skills for working effectively in small groups, documenting and improving processes, collecting and analyzing data and self-managing within a peer group. KAIZEN activity must deal not only with improving results, but also more importantly with improving capabilities to produce better results in the future.
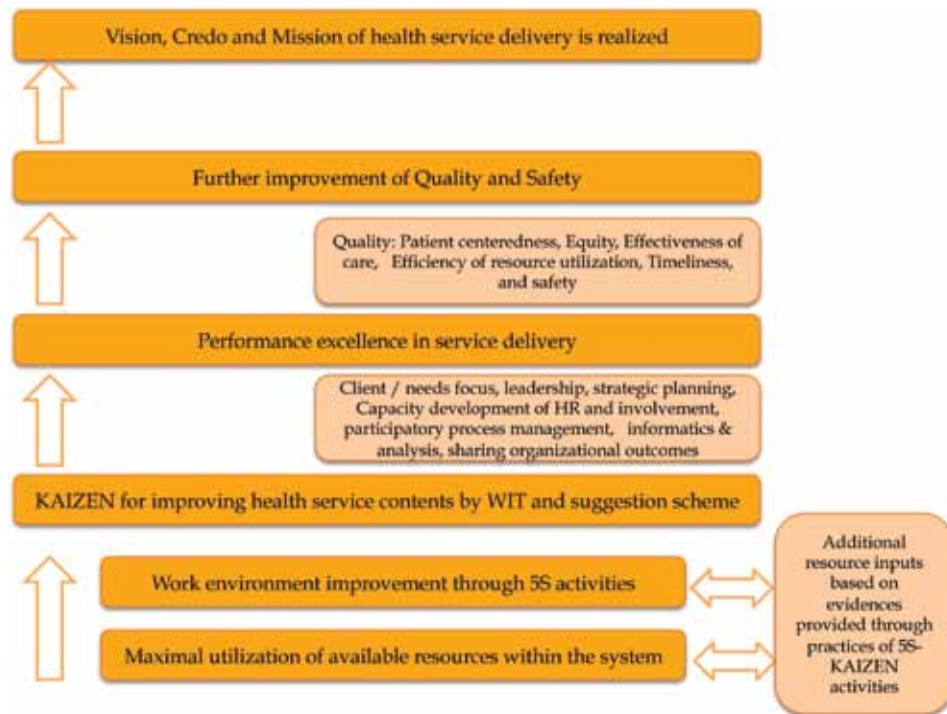
Diagram 12: KAIZEN Framework for health services

4.2. From 5S to CQI (KAIZEN) process

4.2.1. What should be done before KAIZEN?

"Betterment of your work environment" is the first challenge in Continuous Quality Improvement (CQI (KAIZEN)). Without a well-organized venue for work, we cannot provide well-prepared, standardized, and timely services with proper communication with our client, which means that we cannot reach the standards of quality of service we want.

How can we create well-organized working place? Work environment is not an entity only with physical environment, such as building, equipment, and instruments. It includes functional aspects of your working venues, such as personnel team, meetings, recording/reporting system, time arrangement for work and communication system among staff and external counterparts. Environment often defines the behavior of the people. Your workforce is not an exception. If the physical structure and other in-house facilities are comfortable to them, their muscular and mental stresses are much reduced.

They fulfill their work easily and efficiently. On the contrary, under unfavorable and inconvenient work environment, where they have to use extra energy to overcome the inconvenience, people's willingness to do the work properly, naturally deteriorates.

Do you think that your work venues are good enough to promote motivation to work? Are you satisfied with the present condition? Are you sensitive enough to detect inconvenience to yourself and your staff?

There are so many questions, which have to be answered by you. The responsibility of a manager includes the arrangement of the obtainable best work environment for the teammates and staff. Now we have to discuss a feasible approach for us to uplift the work environment. One approach that we can employ is called KAIZEN in Japanese language or Continuous Quality Improvement (CQI). The instrument for the initiation of this approach is 5S principles.

4.2.2. Precondition of KAIZEN

There is a need to lay a foundation for starting KAIZEN activities.

Foundation of KAIZEN is 5S principles; especially S4 (Standardize) and S5 (Sustain) activities need to be practiced well at department level.

Another way of saying that is well implementation of 5S activities make us easy to find problems existing in our workplace.

Facility practicing 5S well developed a culture of eliminating different kinds of wastes, and when problems occurs, it is easy to identify them in the health facility.

Thus, health managers and workers will be able to understand better what is really happening and needs to be tackled within their workplace.
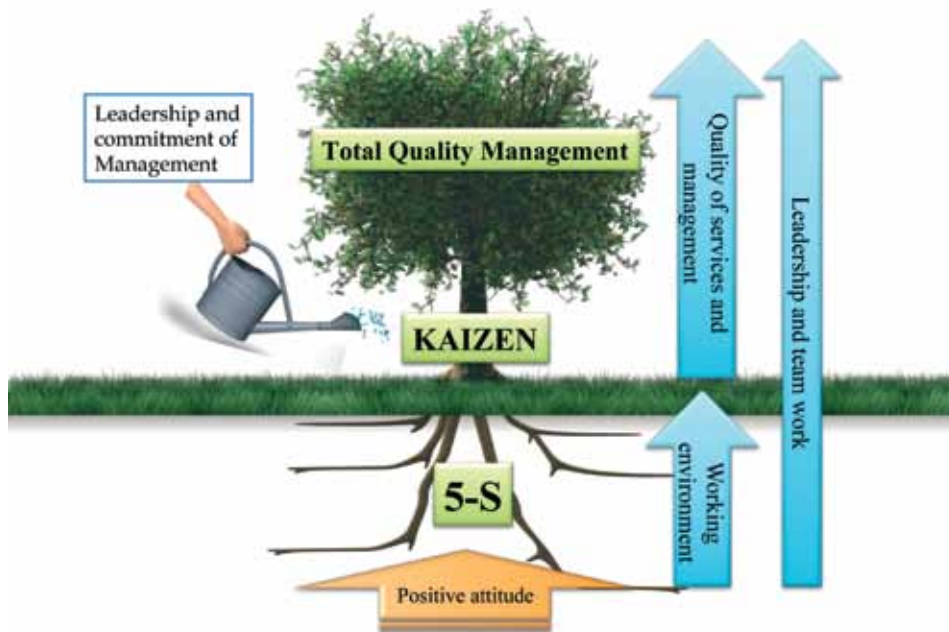
Diagram 13: Illustrate 5S-KAIZEN-TQM Concepts

4.2.3. Conditions for successful KAIZEN

Before starting KAIZEN activities, it is better to understand some conditions that lead KAIZEN practice successfully at health facility. These conditions are as follows:

Receptiveness: Creating receptive environment for ideas is one of the important keys for successful KAIZEN. Every health worker in a facility is encouraged to come up with idea for making things better, accepting changes, suggestions and so on.

Implementation/practice: Taking immediate actions for improvement is one of the important keys for successful KAIZEN. The health workforces are encouraged to implement their ideas as small changes can be done by the worker him or herself with very little investment of time.

Recognition: Quick and easy Kaizen helps to eliminate or reduces waste, promotes personal growth of employees and the organization, provides guidance for employees, and serves as a barometer of leadership.

Cumulative Impact: Each Kaizen may be small, but the cumulative effect is tremendous. Therefore, continuation of Kaizen activities is one of the important keys for successful KAIZEN.

4.2.4. Character of KAIZEN

There are three (3) characters that describe KAIZEN approach.

Permanent method changes: Change the method. Once the change is made, you cannot go back to the old way of doing things.

Continuous flow of small ideas: The smaller ideas are the better. Innovation takes time and is costly to implement, but kaizen is just day-to-day small improvements that when added together represent both enormous savings for the facility and enormous self-esteem for the worker.

Immediate local implementation: Be realistic. KAIZEN is done within realist or practical constraints.

4.2.5. No blame policy and openness for successful KAIZEN

It is often seen that when health workers made mistake or error, the person who made the mistake is blamed and some time, they are punished too. This "Individual blaming policy" exists in many developing countries.

When any mistake occurs in a working process, probably supervisor will ask the person who made the mistake and say; "Why did you make the mistake". Then, the worker might answer; "Oh, I was busy", or "Oh, we do not have enough staff" or "I was in a hurry".

If there is no KAIZEN mind in your supervisor, and organization, counter measures of the mistake will be an opposite of the cause, and he or she might say, " Do not make a mistake" or " Do not be in a hurry". Opposite of the cause will not solve the problem or reduce same kinds of mistakes.

"Individual blaming policy" will make "problem" to remain dormant, as workers are scared of reporting their mistakes or errors, and stand in awe of losing job. It means that no report on medical error, accident, or mistakes will appear to surface, and it is impossible to tackle with problems for improvement of the situation. In such a situation, "No individual blaming policy" needs to be applied and blame the system or way of doing things. If the organization has KAIZEN mind as their culture, supervisor think as "Is there any problem on the way of doing things in our system?" and need to focus on "Why this is happening", then you will find a clue for KAIZEN.

It is important to try to find the root cause of the problem or mistake and then tackle the root cause(s).
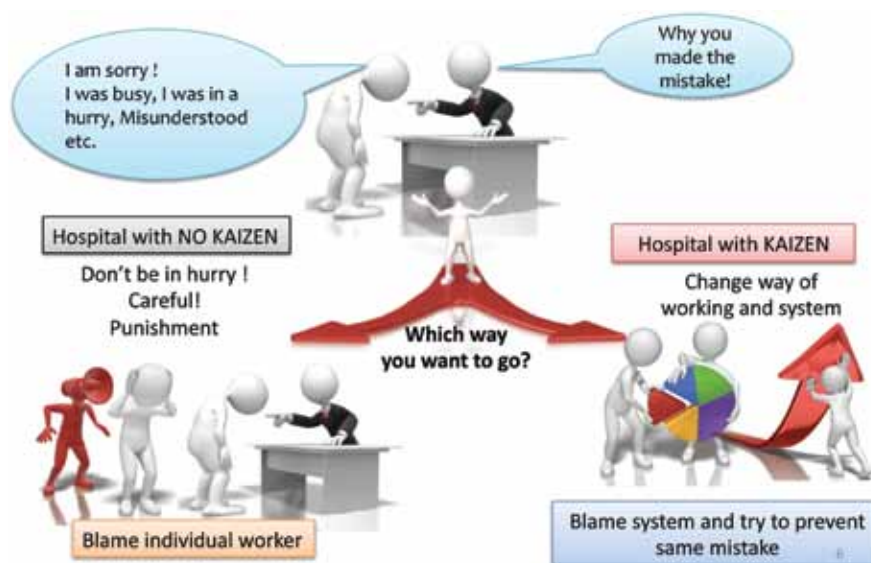
Diagram 14: Entry point of KAIZEN-change culture of organization

4.2.6. Two levels of KAIZEN

There are two levels of KAIZEN. One is called "Small KAIZEN", and other one take a standard "KAIZEN process". "Small KAIZEN" should be the first choice of making things better without any financial input or very little financial input, and quick improvement. On the other hand, "KAIZEN process" takes time and financial input.

Diagram 15: Two levels of KAIZEN

4.2.7. Starting from "Small KAIZEN"

Hearing the word "KAIZEN" makes us to think about "doing something hard". Many people have the images of "KAIZEN" as "changing big", however, "KAIZEN" is not a difficult thing. It is to change things little by little or change what you can do in a short period of time with available resources. Then, continue those small changes.

It is better not to think of changing things all at once, but rather to think of changing whatever you can. It means that put feasible "KAIZEN" measure into practice. As it goes, little things make a big difference. Continuation of small KAIZEN activities will be able to make a big change. However, the people, who are stuck with the idea that KAIZEN is a difficult and hard thing to do, it is difficult to convince them. Therefore, use pictures, numbers and other evidences to explain about KAIZEN.

Here is the good example of small KAIZEN. The picture bellow was taken at one of the base hospitals in Sri Lanka.

The hospital gardener came up this small "KAIZEN" idea, and the management of hospital adopted it to maximize productivity of the staff and minimize water usage. The gardener used to pull a long water pipe and took a lot of time for watering plants all over the hospital. However, the gardener came up with an idea to utilize used empty IV drips container and line without needle to drop water to watering the plants. After introducing this KAIZEN idea, workload of the gardener was reduced and possible to do other works, and water usage was reduced. By such a small idea, the hospital accomplished the reduction of workload of staff, costs, and could improve productivity.

As indicated in the Diagram 16: Example of small KAIZEN at a Base hospital in Sri Lanka, a clue of KAIZEN is "analyze the way of doing your work". Looking at the current work process, which consumes time and financial resources, low productivity and safety, and makes worker tired, it is necessary to analyze the way of doing your work for improvement. Quick and easy KAIZEN empowers employees, enriches the work experience and brings out the best in every person. It improves quality, safety, cost structures, delivery, environments, throughput and customer services.

Diagram 16: Example of small KAIZEN at base hospital in Sri Lanka

Even small changes, small KAIZEN activities should be recorded. Very simple format can be used to keep record of small KAIZEN activities, and the format called – "KAIZEN Memo" as shown below in Diagram 17 and 18.

Simply record the current situation or problem the section is facing, and add what kind of input and solution applied with picture or drawing. Finally, benefits and outputs obtained from the small KAIZEN need to be recorded on the right side of the format with pictorial records (after small KAIZEN).

………………………………………Unit/Ward/Department	
Implemented date : / / Head of WIT:…………………………………	
Before Improvement (KAIZEN)	After improvement (KAIZEN)
1) Problems 2) Kaizen points 3) Input Pictures **before** KAIZEN	1) Benefit/Outputs Pictures **after** KAIZEN

Diagram 17: Example of KAIZEN Memo format

Surgical ICU **Implemented date : December 2008**	
Before Improvement (KAIZEN)	After improvement (KAIZEN)
1) Problems • Staff, visitors often confused the status of shoe cover • There were inappropriate practice of Infection Prevention and Control **2) Kaizen point** • Establish boxes for shoe cover for "safe/clean" and "dirty" at entrance of ICU **3) Input** Two empty boxes and stationeries	**1) Benefit** • Confusion of shoe cover status is reduced • Infection prevention and control are improved

Diagram 18: Actual usage of KAIZEN Memo

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4.2.8. Small KAIZEN to effective and beneficial KAIZEN

By continuous practice of small KAIZEN, and solving small problems, bigger problems, which take time, costs, human resource input and other resources, will remain in workplace.

To solve those bigger problems or improve such situation, it is necessary to take some actions that need to learn some skills for using Quality Control (QC) tools and statistical analysis methods. Basically, it is necessary to think or analyze such problems, and come up with solution by using Plan-Do-Check-Act (PDCA) concept, which is the backbone of managing "KAIZEN" problem solving approach.

4.2.9. What is PDCA Cycle?

Dr. Walter A. Shewhart and Dr. W. Edward Deming advocated PDCA concept for productivity management, and continuous quality improvement of process and products. PDCA is the "golden cycle for improvement". It is a methodical approach for problem solving and continuous improvement. PDCA wheel should be considered a never-ending cycle for improvement towards an ideal condition.

Plan is to establish objectives and process or countermeasures with expected outcome based on the past performances or future forecasting of work.

Do is to implement the processes or countermeasures planned.

Check is to measure the effectiveness or achievement of processes or countermeasures planed between the actual results and expected results to ascertain any differences.

Act is to analyze the differences to identify the causes of "Gap", and take necessary action to improve changes.

In improving situations or solving problem with KAIZEN process, it is fundamental to get everyone's participation.

Diagram 19: PDCA cycle

4.2.10. PDCA cycle and KAIZEN

PDCA cycle is the concept behind the KAIZEN approach. Look at how PDCA cycle is used in KAIZEN approach. PDCA is rotated like the way described in the Diagram 20.

During the planning, 5W1H need to be clarified against the theme or topic as shown below:

Why are we undertaking the project?

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What are we going to do? What data is required?

Who is responsible for each task? Who should be involved?

Where can we find relevant data and facts?

When must a task be complete? When do we need to give feedback?

How must it be accomplished? How do we review?

Then, implement the plan and see the effectiveness and efficiency of those activities that are taken. Then, activities that show good result should be standardized and adopted in routine practice. The activities that do not reduce the problems should be discontinued and it is necessary to plan better activities for improvement of the situation.

This matches exactly with the KAIZEN Process that will be explained in the next section. However, PDCA cycle consists of four steps only and the cycle may be stopped at Act often. Kaizen aims to raise the standard of our workplace, productivity, quality and safety in a continuous upward spiral through rotating PDCA cycle, reflecting on achievement of KAIZEN and taking action to improve the way for next KAIZEN.

Plan, preparing how to implement KAIZEN - Clarify the objectives and decide on the control characteristics (control items) - Set measurable target - Decide on the methods to be used to achieve the target.

Do, Implementing KAIZEN activities - Study and train in the method to be used - Utilize the method - Collect the measurable data set up on the plan for decision-making.

Check, Reviewing the result of KAIZEN activities and achievements - Check whether the results of implementation has been performed according to the plan or standard - Check whether the various measured values and test results meet the plan or standard - Check whether the results of implementation match the target values.

Act, taking countermeasures based on the review in "Check" - If the results of implementation deviate from the plan or standard, take action to correct this - If an abnormal result has been obtained, investigate the reason for it and take action to prevent it recurring - Improve working system and methods. The diagram below explains which KAIZEN process match with PDCA cycle.

It is often misunderstood that KAIZEN is the Japanese name of PDCA cycle. This must be clarified that PDCA cycle is used, as the backbone of KAIZEN process, and it is not exactly same as original concept of PDCA. It can say that KAIZEN process is the improved concept and practical approach derived from PDCA cycle.
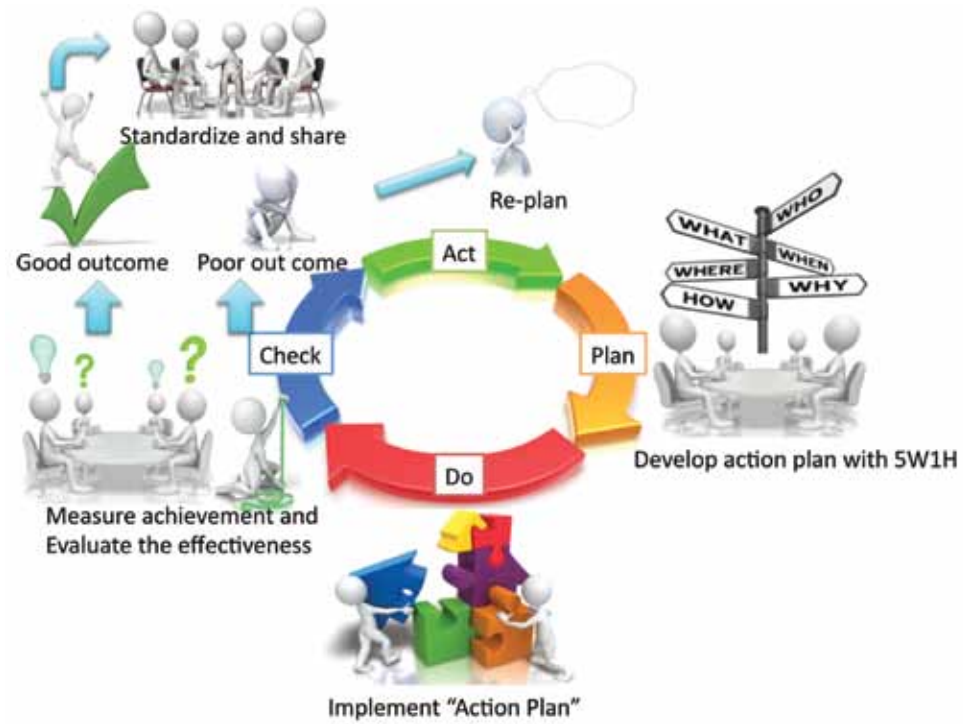
Diagram 20: PDCA cycle and KAIZEN Process

Original PDCA cycle is often illustrated as "closed cycle". However, "PDCA" used in KAIZEN is not "closed cycle". It is "open quality spiral". Since PDCA cycle consists of four steps only, the cycle maybe stopped at "ACT " often. KAIZEN aims to raise the standard of our workplace, productivity, quality and safety in a continuous upward spiral through rotating PDCA cycle, reflecting on achievement of KAIZEN and taking action to improve the way for next KAIZEN.
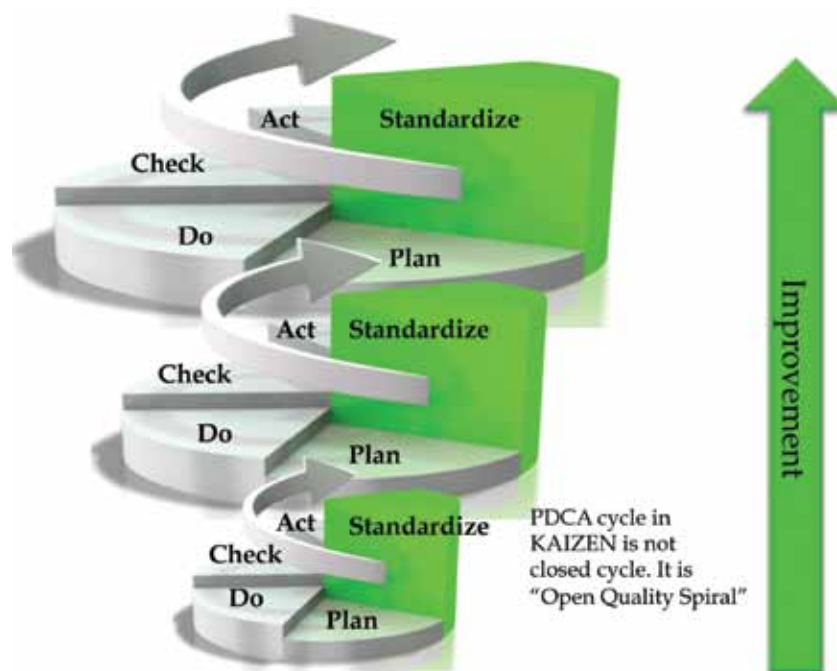
Diagram 21: "Open Quality Spiral" for CQI

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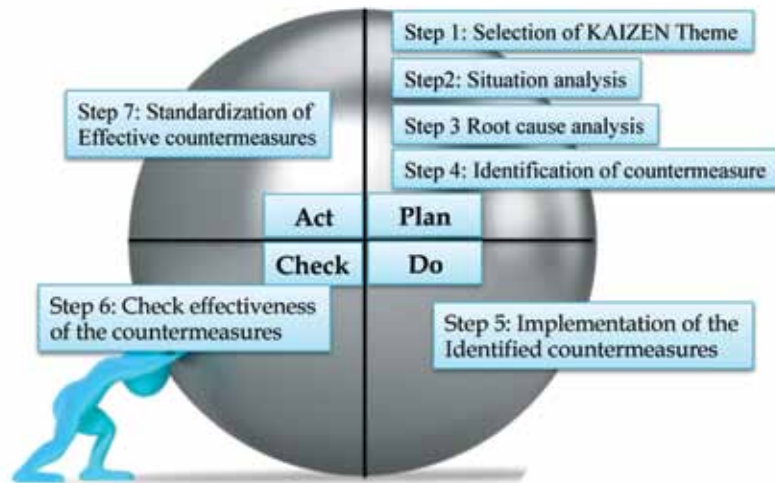
Diagram 22: PDCA cycle and KAIZEN Process

4.3. How to implement KAIZEN process (QC Story)?

4.3.1. KAIZEN Process for problem solving

As mentioned in the above, KAIZEN is the approach of solving problems that exist in workplace. KAIZEN process was established as a sequential process of events based on PDCA (Plan-Do-Check-Action) cycle, so-called "Quality Control (QC) story". QC story is a basic procedure for solving problems scientifically, rationally, efficiently and effectively. Before try to solve "problem", it is necessary to understand what is "problem".

"Problem" can be defined as "the gap between ideal situation and current situation".
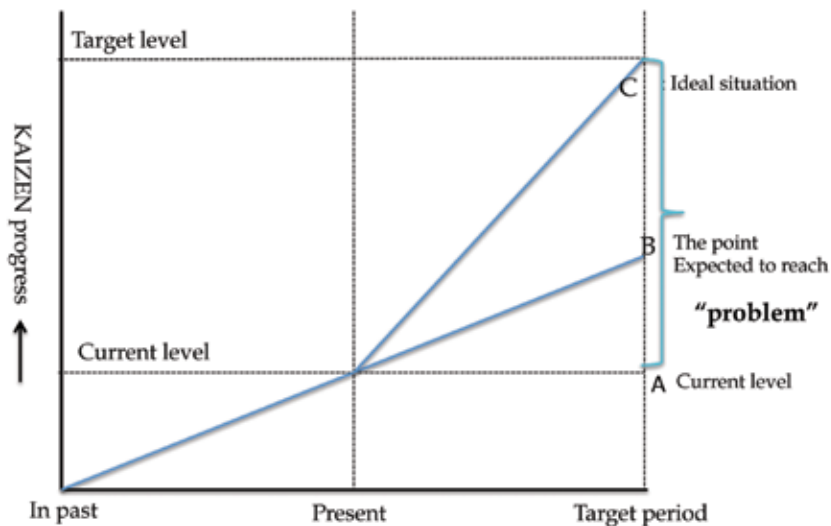
Diagram 23: What is "Problem"

Then, it is necessary to take some action for making things better and close to the ideal condition or situation. To do so, it must take some steps to solve "problem" or minimize "gap". Generally, these steps are called "QC story", and it consists of 7 steps. The 7 steps of QC story are like when a mountain climber is climbing High Mountain. We need to make sure the correct route and taking process step by step.

Step 1 is "Selection of KAIZEN theme" - the issue needs to be tackled, and then followed by analysis of the current situation of selected KAIZEN theme together with target setting; that is Step 2. In Step 3, try to find root causes for the issues / problems. In Step 4, think of counter-measures to tackle the issues / problems, and then implement the identified counter measures in Step 5. In Step 6, it is necessary to check the effectiveness of the counter measures. In Step 7, if the countermeasures are effective in reducing the problem or improve the situation, standardize the counter measures for easy implementation by anyone who may face same problem in the future. Even though, a problem is solved, it may have other problems affecting the set theme. Therefore, finally, it is necessary to sort unsolved problems and plan for next KAIZEN activities.

Solving problems at working place
And improve situation and condition

Step 7: Standardization of effective countermeasures

Step 6: Check effectiveness of the countermeasures

Step 5: Implementation of the identified countermeasures

Step 4: Identification of countermeasure

Step 3 Root cause analysis

Step 2: Situation analysis

Step 1: Selection of KAIZEN Theme

Diagram 24: KAIZEN Process

Note that the situation created by KAIZEN process may not be the best. If you think that is the end of KAIZEN, things will not improve further. Client's need and expectations changes easily. Therefore, always consider client's needs and expectations, and continue KAIZEN activities.

To complete KAIZEN process for solving problems scientifically, it is necessary to take the 7 steps mentioned above. Each step needs to use some tools and information that is collected routinely. The process needs to be understood properly. It is necessary to learn each step more in detail.

4.3.2. Who practice KAIZEN at workplace?

"Target of KAIZEN is one's own work, not others". This is the very basic concept of KAIZEN implementation. In a traditional way, suggestion box has been used to identify problems happening in a hospital, and try to solve the suggested issues. However, those suggestions are made by others and it is difficult to set priority and solutions as most of them are complain and no suggestion for betterment. Then, it will be left out and no change made. However, KAIZEN is different. The person identifying problems must come up with ideas for improvement, and also implement those ideas.

In actual settings in health facility, individual action is not recommended. Therefore, a team should be established with section or unit and practice KAIZEN activities as a team. Usually, the team practicing KAIZEN at section level called Work Improvement Team (WIT) with the members of 5 - 6 staff working in the section.
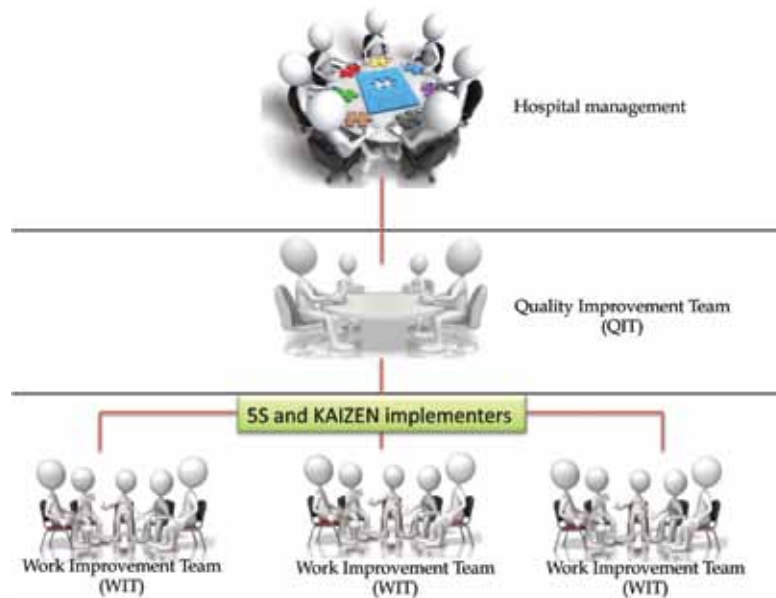
Diagram 25: QI implementation structure

4.3.3. KAIZEN Process (QC Story) steps

Step1: Selection of KAIZEN theme

The first step of KAIZEN is to select KAIZEN Theme. The step takes participatory process. It starts from discussion on difficulties that staff and clients are facing in their workplace, and then select a KAIZEN theme that can be improved within a given period of time with existing resources.

During the brainstorming meeting, possible KAIZEN themes (It is called KAIZEN suggestion) will be suggested by staff working at the department, section or unit based on:

• Claim from clients/patients

• Mistakes often happening

• Working process that takes time and are hard to do it

• Medicines and equipment that are 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 feasibility on each suggested theme.

Feasibility of 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 has to be tackled with immediately.

3. Realization: Is it possible to tackle with existing resources (costs, human resource time, information availability etc.)

4. Burden to service users: It is of less burden to service users

KAIZEN activity should be carried out accurately and statistically. For example, in a ward, giving wrong medicine to patients was occurring frequently. Therefore, when this ward held a meeting for selection of KAIZEN themes, "Giving wrong medicine is reduced" was raised as one of the possible themes.

On the other hand, another staff raised a problem of small working space, and others raised many sampling mistake, high wastage volume of medicine and so on. Based on the matrix in the above, highest mark obtained is "Giving wrong medicine is reduced" as it will have immediate effects, does not require many resources, and is possible to realize.

Possible KAIZEN Theme	KAIZEN Theme selection				
	Immediate effect	Urgency	Realization	Burden to service users	Score
Ward space is expanded	◆	✕	◆	✕	2
Giving wrong medications to patients is reduced	○	○	○	◆	7
Sampling mistake of laboratory tests is reduced	◆	◆	○	○	6
Medicine wastage volume is reduced	○	◆	◆	◆	5

○: 2 points, ◆: 1 points
✕ : 0 points

Diagram 26: Example of Kaizen theme selection matrix

KAIZEN theme should be selected as low resources input and possible to implement and complete all seven steps within short period (approximately in 6 months). All process for selection of KAIZEN themes must be recorded to explain why and how KAIZEN theme was selected.

KAIZEN theme should be described in "ideal situation". In the above example, like in the example given, if many cases of giving wrong medicines are occurring, many people write, " To reduce prescription of wrong medicines" in objective way. What should be done will be clear in objective case. However, this is not clear how the situation should be.

"Giving wrong medicine to patients" was the problem that they were facing, and ideal situation of this problem is "Giving wrong medicine is reduced". The reason why it should be described in " ideal situation" is to clarify what we are aiming for, and make everyone to understand the target situation. Therefore, it is recommended to describe in a perfect tense like "Giving wrong medicine is reduced".

Step 2: Situation Analysis of selected theme and target setting

After KAIZEN theme selection, accurate and statistical analysis of current situation needs to be conducted. Using the example of the above, "Giving wrong medicine is reduced", it is necessary to know what are the contributing factors leading to "Giving wrong medicine".

Diagram 27: data collection for situation analysis

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Collection of right information and data is the key for accurate situation analysis. To do so, it is necessary to check the availability of information and data related with the selected KAIZEN Theme. If the data and information were kept well and available, WIT needs to collect them and study the trend or movement. However, if data and information is not available, it is necessary to identify necessary data and information, and then start collecting them for certain period.

Collected data and information should be analyzed properly. There are some tools that are useful for accurate and statistical situation analysis used in KAIZEN process called QC tools. One of the tools is called "Pareto Chart".

In the Step 2, Pareto Chart is useful for prioritization of target(s) for problem solving, when various contribution factors exist. Visualize frequency of incidents contributing to the problem is also helpful for decision making on prioritization of target for problem solving.

Pareto Chart is able to identify "the contributing factors that need to be focused for better improvement". It means, identifying the contributing factors that has high frequency and affecting work process most. To make a Pareto Chart correctly, it is necessary to count frequency of incidents that are causing or contributing to the problem (selected as KAIZEN theme) and calculate accumulation ratio of the incidents like in the table below.

Table 7: Example of table for cumulative frequency

Incidents related with giving wrong medicines	Frequency	Accumulation (Cumulative Frequency)	Accumulation ratio
Giving wrong Injectable medicines	14	14	14÷31 = 0.45
Giving wrong inhale medicines	11	25	25÷31 = 0.81
Giving wrong oral medicines	3	28	28÷31 = 0.90
Giving wrong volume of Insulin	2	30	30÷31 = 0.97
Apply wrong ointment	1	31	31÷31 = 1.00
Total	31		

Making the above table 7 is the first step to draw Pareto Chart. On the process for making Pareto Chart, place the high frequency one from the left of the graph like below so as to visualize "the problem that need to be focused on". Set frequency of occurrence on the left vertical axis of the chart and, set cumulative ratio of the total number of occurrences on the right vertical axis of the chart like example shown below.
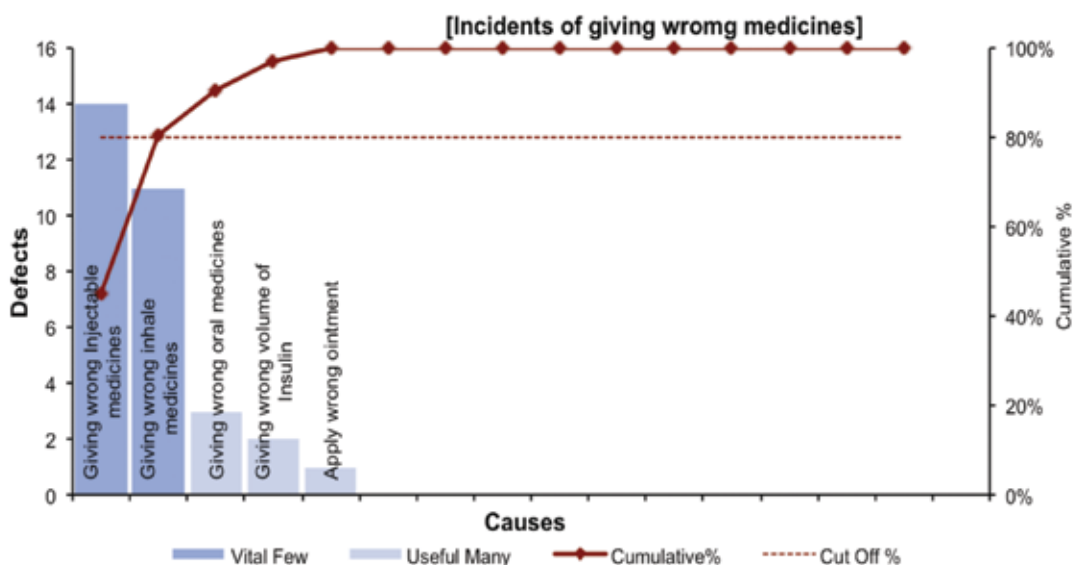
Diagram 28: Example of Pareto Chart

There is free tool for making Pareto Chart available on Internet, and it is recommended to use those tools for making you work easier and simpler. Reference: http://www.vertex42.com/ExcelTemplates/pareto-chart.html

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 needs to be addressed to resolve the 80% of the problems.
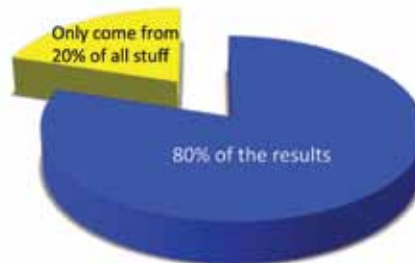
Diagram 29: Pareto rule (80:20 rule)

Target setting:

In Step 2, the current situation is clarified with numbers, and now, it is easy for us to set "target". "Target" means how much can the problem (gap) be reduced, minimized or improved. Using the example from Step 2, only the "giving wrong injectable medicine" and "giving wrong inhale medicine"accounts for 80.6% of the problem. Which means if we could reduce or avoid those two major incidents, majority of the problems will be solved or reduced.

Well, how can we set the target? At the first time, probably 30% to 50% of reduction from the current situation is valid. At the same time, it is better to set the time frame for the KAIZEN activity. Use of the Pareto chart by choosing the first or the first and second most frequent causes will make the calculation of the target easy.

Once the top 20% of the causes that are (representing 80% of cases) identified, then tools like the Ishikawa diagram (Fish-bone Analysis) can be used to identify the root causes of the problems. Also the application of the Pareto analysis in risk management allows management to focus on the 20% of the risks that have the most impact on the project.

Step 3: Root Cause Analysis

Finding root cause(s) of the problem (KAIZEN theme) and tackle with root causes is very important to solve or reduce the problem. In this process, "Fishbone diagram ", one of QC tools, is used to identify root cause(s) "Fishbone diagram " is useful for sorting various causes, and it is able to clarify a causal-effects relationship under the selected KAIZEN theme.
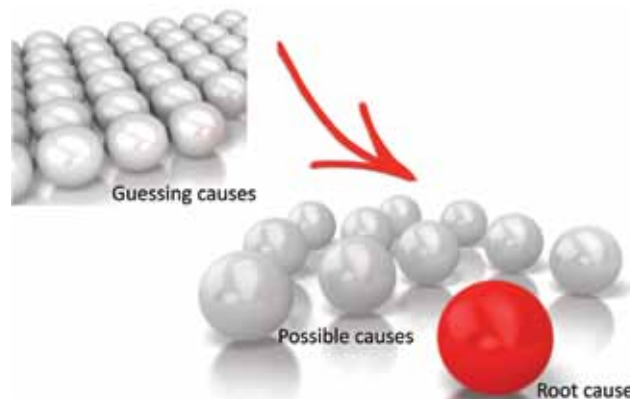
Diagram 30: Basic concept of root cause analysis

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First procedure of root cause analysis is to list "Guessing causes", and then focus on "Possible causes". Finally, identify "Root causes" from the "Possible causes". How to narrow down from "Guessing causes" to "Root causes" is simply ask and repeat "why-because", minimum of five times.

Let's use the example of "giving wrong medicine is reduced". Based on the situation analysis and result of Pareto chart, the main incidents that need to be tackled with are "giving wrong injectable medicine" and "giving wrong inhaling medicine". Therefore, it is necessary to develop two (2) fishbone diagram for "giving wrong injectable medicine" and "giving wrong inhaling medicine".

Head of "fish" will be the identified contributing factor, not KAIZEN theme and need to find root causes for one contributing factor and another. Let's pick up "giving wrong injectable medicine" as example. Diagram 31 is the example of Fishbone analysis to identify root causes of "giving wrong injectable medicine"
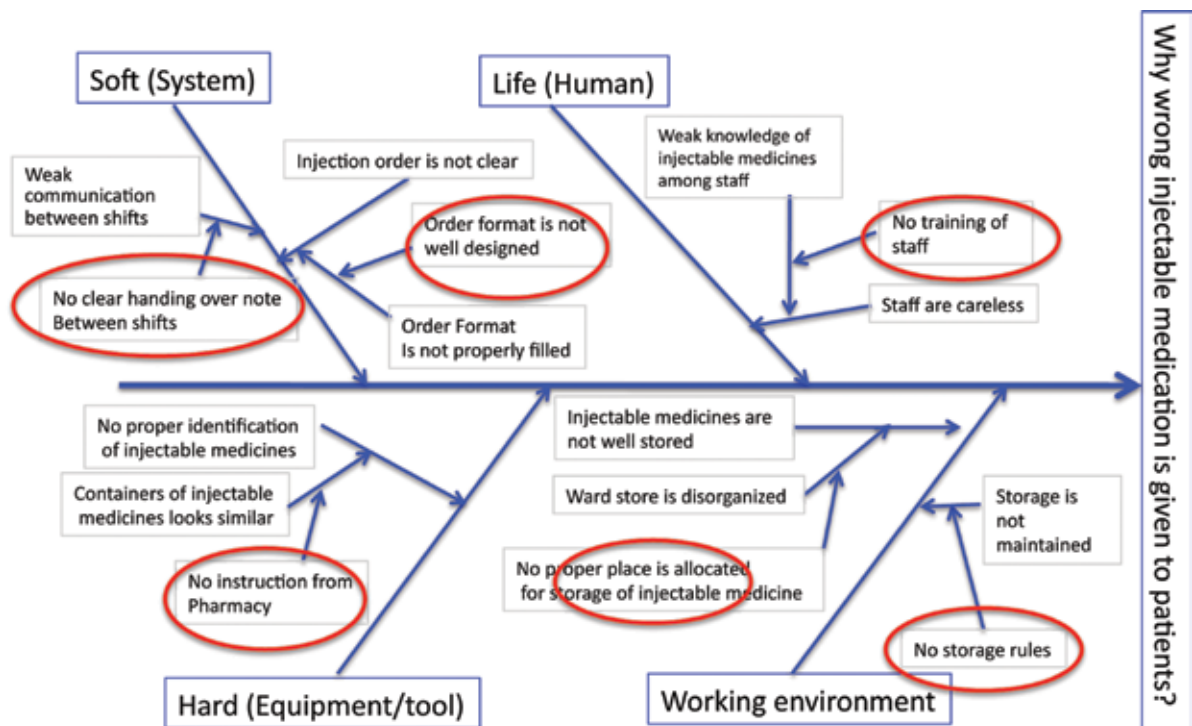
Diagram 31: Example of fishbone analysis (root cause analysis)

Easy way of making "Fishbone analysis" is to start categorizing causes into groups. Categorization of issues into groups will help us to identify causes smoothly. There are few ways for grouping;

(a) *MSHEL grouping*

Grouping issues into 5 groups called "MSHEL" (M: caused by Management, S: caused by Software, H: caused by Hardware, E: caused by Environment, and L: caused by Life (human).

(b) *4M grouping*

Grouping issues into 4 groups called "4M" (Man, Machine, Material, Method)

Category or group can be increased according to the needs and nature of problem. Most important thing is to observe trend and movement of problems.

For finding root causes, ask, "Why it is happening- because..." 5 times for each possible cause and extend branches from each possible cause until it is embodied. Finally, circle the identified root cause in red.

Free tool for making fishbone analysis diagram is available on Internet. Using those tools will make you work easier and simpler. Reference: http://www.vertex42.com/ExcelTemplates/fishbone-diagram.html

Step 4: Identify Countermeasures for solving KAIZEN theme

After root causes analysis, next step is to think of the ways to eliminate the root causes. Therefore, it is necessary to come-up with countermeasures for eliminating or reducing those root causes. In this process, two QC tools are used to select countermeasures. One is "Tree diagram", which is used to identify possible countermeasures.

Other one is "Matrix diagram", which is useful for checking feasibility of those identified countermeasures. Feasibility of identified countermeasures should be evaluated in terms of 1) importance, 2) Urgency, 3) Difficulty, 4) Time consumption, 5) Resource availability.

How to make Tree diagram

List the identified "root causes" in Step 3 on the left end. Then, start brainstorm countermeasures with team members. If the countermeasures are identified, connect the line with each "root causes" systematically (1st line countermeasures). Then, brainstorm again to come up with realistic countermeasures and branch them from 1st line countermeasures (2nd line countermeasures). Note that it is not always one countermeasure for one root cause. Therefore, if more counter measures identified for a root cause, branch line and connect like in the diagram 32.

How to make Matrix diagram

After development of the Tree diagram, feasibility of identified countermeasures needs to be looked at with Matrix diagram. As mentioned in the above, the following terms are used to evaluate the feasibility of countermeasures; 1) Importance, 2) Urgency, 3) Difficulty, 4) Time consumption, 5) Resource availability.

WIT or KAIZEN team must have agreed set of evaluation scale for feasibility check before making Matrix diagram. Then, evaluate feasibility of each countermeasure through discussion among team members and mark according to the agreed scale like example showing below:
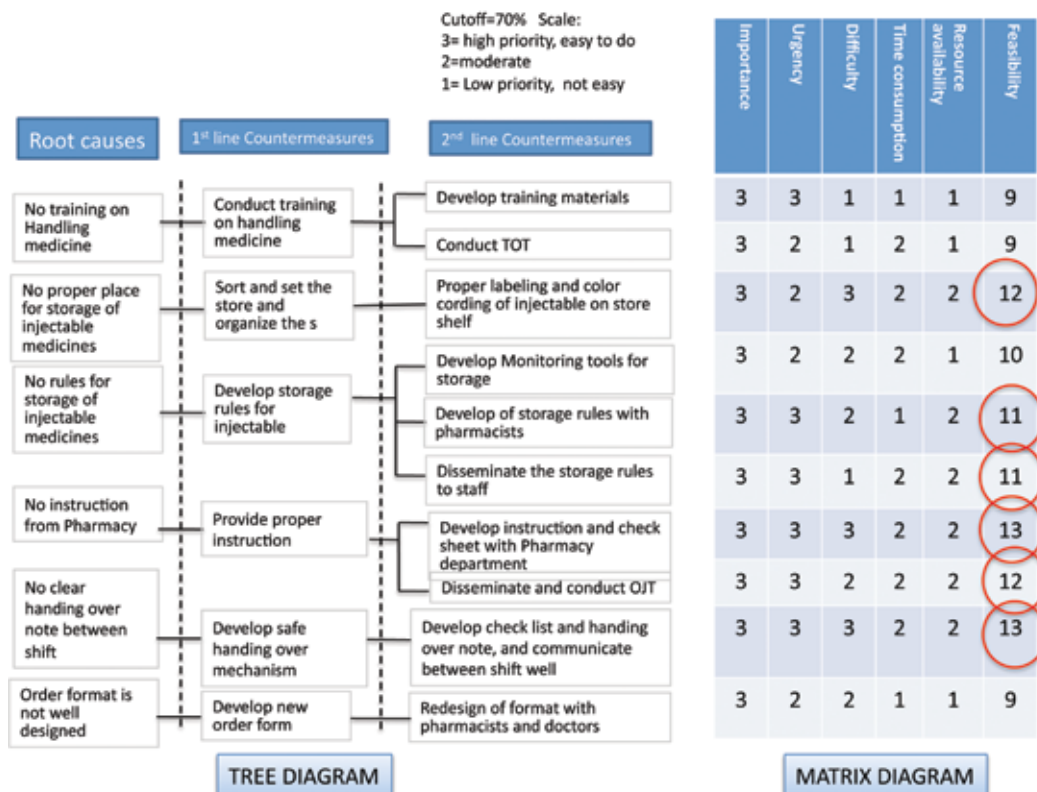
Diagram 32: Example of Tree diagram and matrix diagram

The example showed in the above use the scale from 0 to 3. Each countermeasure is evaluated using the scale. Note that explanation of evaluation scale is very important to reduce confusion in and out side of the team. For instance, "0" has negative meaning and "3" has positive meaning. For example, if a countermeasure got "0" point in "importance", which means that counter measures is "less important". If a countermeasure got 3 points in "Difficulty", it means that counter measures is "not difficult to implement".

The countermeasures that got more than 11 points out of 15 (Cutoff line is the above 70%) are selected as feasible countermeasures.

Step 5: Implementation of identified countermeasures

Countermeasures that are evaluated as "feasible", it will be implemented by WIT. Implementation period of "feasible countermeasures" is usually between 2 months to 3 months. If the "feasible countermeasures" take long time to implement and need lots of preparation, those are not "feasible countermeasures" and stop implement.

Diagram 33: Time frame of KAIZEN process

To facilitate the implementation of "feasible countermeasures", it is important to develop Implementation plan by WIT. Key for developing effective Implementation plan is to clarify 5W 1H (Why, Where, Who, When, What, How) that make all team members understand the roles and responsibilities of everyone involved in the KAIZEN process, and how to implement.

- Why (are taking this action?)
- Who (is responsible for?)
- When (must be completed? How often?)
- Where (it is taking place?)
- What (should be done or is output?)
- How (to achieve / do it?)

Progress of each countermeasure must be monitored regularly and the result came out from each countermeasure should be shared not only with team members but also other workers in the department/section.

Table 8: Example of Implementation Plan

Counter Measures	*WHO*	*WHEN*	*WHERE*	*WHY*	*WHAT*	*HOW*
Develop of storage rules with pharmacists	Ward In-charge and pharmacist	By Dec.01	At the ward	Strengthen stock management of medicines	Storage rules and regulation	Develop
Develop check list and handing over note, and communicate between shift well	Ward In-charge and WIT leader	By Dec.15	At the ward	Reduce miscommunication	Checklist and handing over note	Develop
Develop instruction and check sheet with Pharmacy department	Head of Pharmacy and Ward in-charge	By Nov.10	At the ward	Reduce taking wrong injectable	Medicine handling instructions	Develop

After development of the implementation plan, it should be displayed on the staff notice board at department/section level. Information sharing is important to remind WIT members to implement and monitor KAIZEN activities on time and share progress in the department/ section.

Verification of effects:

The following actions need to be taken in Step 5:

- Collect baseline data for each countermeasure
  - Ex. "Knowledge is improved through training"
  - Pre-assessment of training need to be done and the results must be analyzed
- Develop Monitoring check sheet based on "action plan" of each countermeasure
- Use the check sheet to observe "effects" of countermeasures during the implementation of countermeasures

Step 6: Check effectiveness of the countermeasures

After the implementation of identified countermeasures, effectiveness of the countermeasures must be measured. As used in Step 2, "Pareto Chart" is useful for measuring effectiveness of countermeasures and easy to make comparison between before and after KAIZEN activities. Procedures for making "Pareto Chart" in Step 6 is exactly same as explained in Step2. However, cumulative table can be combined before and after KAIZEN activities showing like a below.

Table 9: Differences between before KAIZEN and after KAIZEN

Mistakes related with sampling	Frequency before KAIZEN	Frequency after KAIZEN	Reduction of Frequency	Reduction Rate
Giving wrong injectable medicines	14	7	7	50%
Giving wrong inhale medicines	11	6	5	55%
Giving wrong oral medicines	3	2	1	66%
Giving wrong volume of Insulin	2	1	1	50%
Apply wrong ointment	1	1	0	0%
Total	31	17	14	Average of 55%

The example used in this Chapter, the target set in the Step 2 was "Frequency is reduced by 50% from the current situation". As stated in the table above, reduction rate is 55%, and achieved the target.
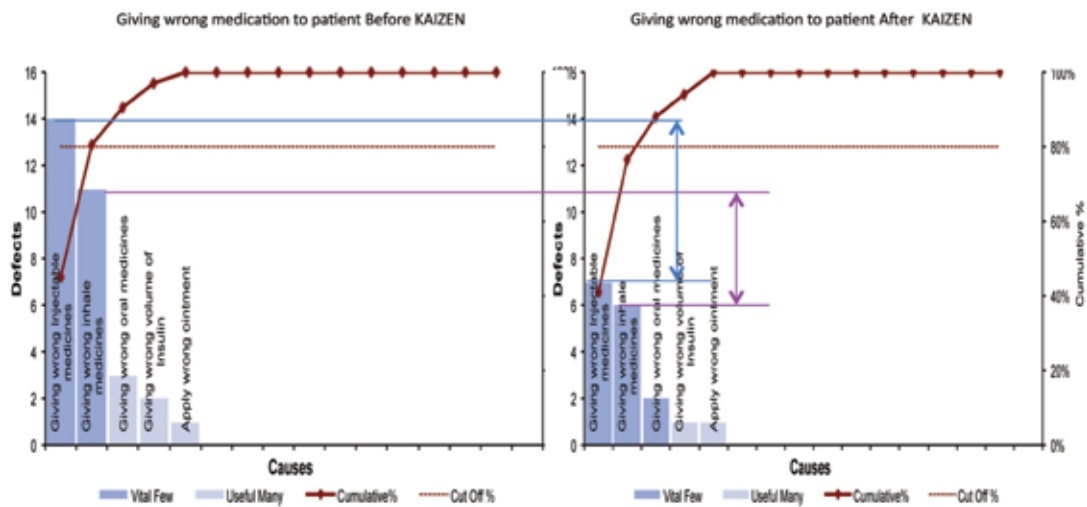
It means that the countermeasures implemented were effective. However, it is difficult to say which countermeasures were effective to reduce the frequency of the problem.

Identification of effective countermeasures is very important for standardization of effective counter measures.

The relationship between countermeasures and effectiveness can be defined as listed the table 10 below: Use the monitoring results and place the countermeasures according to the situation and condition.

Table 10: Countermeasures – effectiveness relationship

		Effectiveness	
		Effective	Not effective
Countermeasures	Implemented	1 It is effective and need to be standardize	2 It is not effective and need to review measures
	Not implemented	3 Need to clarify why it is effective	4 Implement some measures (Do something)

Verification of effects:

The following actions need to be taken in Step 6:

Evaluate the implementation status of the countermeasures through the monitoring check sheet

Conduct situation analysis with the same method used in Step 2 for verification of results and effectiveness of KAIZEN activities

Evaluate the outcome of the countermeasures

Collect data and compare with baseline data

How "effects" are verified as follows;

• Various methods for measuring "effectiveness" of countermeasures

- Qualitative and quantitative measures can be applied according to the target/objectives

"Effectiveness" can be categorized into the following categories:

- Tangible effects = Expected outcome
- Ripple effects = Predicted outcome
- Intangible effects = Unexpected outcome

    If you observed "Intangible effectiveness" also, it needs to be recorded.

Step 7: Standardization of effective measures

(Sorting of unsolved problems for next KAIZEN Plan)

After identified effective countermeasures in Step 6, it is necessary to consider preventing recurrence and sustainability of the improved situation. Therefore, Standardization of effective methodology is essential. Actual meaning of "standardization" is not only "standardize method(s)" but also all workers in the department/ section must practice the "standardized" manner.

Why standardization is necessary? It is because;

- No "Standardization" means discontinuation of KAIZEN effects. It means that there is a possibility of recurrence of the problem
- Stabilize processing time, costs, workloads that improved by KAIZEN
- Work or services process that requires some level of quality needs to be standardized to meet customer satisfaction

Note that discipline is a key for successful "Standardization" of KAIZEN Process.

Diagram 34: Standardization process in Step 7
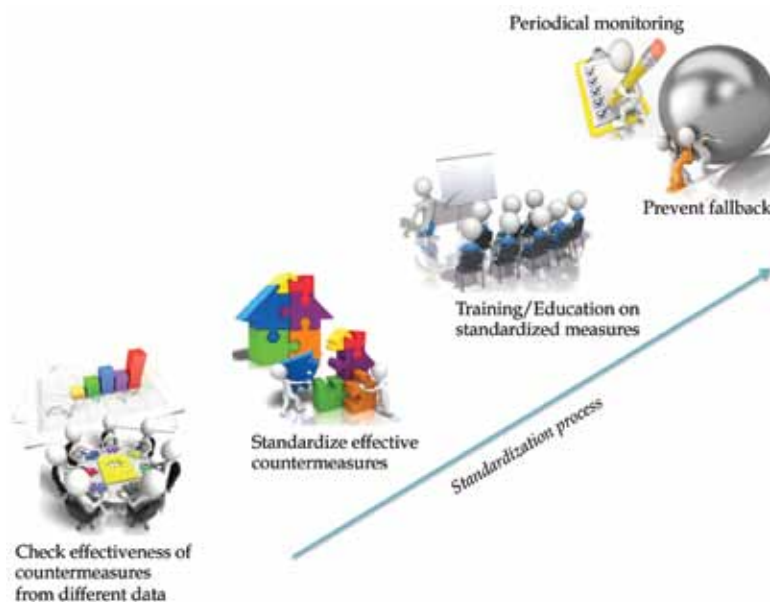
How to standardize the effective countermeasures?

Like an implementation plan developed in Step 5, it is necessary to develop Standardization plan in Step 7. It is to clarify standardization procedures with the information of 5W1H (Why, Where, Who, When, What, How). Moreover, it is necessary to develop a checklist to monitor implementation of standardized countermeasures.

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There are a few tips to make Standardized Procedure Table with 5W1H as follows;

- "Countermeasures" that showed effective results of KAIZEN are placed in the "WHY" column
- In-charge of the activity is placed in the "WHO" column
- Period of implementation is placed in the "WHEN" column
- Place that activities take place is placed in the "WHERE" column
- Output or tools used for the activity is placed in the "WHAT" column
- Methodology to carry out the activities is placed in the "How" column

Format of Standardized Procedure Table with 5W1H is very similar to the action plan developed in Step 5. Therefore, should not confuse and not to mix-up this two. Example of Standardized procedures is shown below:

Table 11: Example of Standardized procedures

WHY	WHO	WHEN	WHERE	WHAT	HOW
For strengthen the management medicine storage	In-charge of stock management	Daily	Ward	Inventory and checklist	Continuously practice
To reduce miscommunication between staff for reduction wrong medication	All staff working at the ward	Before taking over next shift	Ward	Handing over note and checklist	Check the note and checklist before new shift start

Only making a standardized procedure table does not make any sense. All workers in the department or section must practice the listed standardized measures continuously. Therefore, regular monitoring with proper checklist is an important for us to know how the workers are practicing and ensuring the standardized method in sustainable way.

Period of monitoring should be agreed within the team, and shared with everyone working in the department or section.

Table 12: Example of Checklist for standardized measure

Date	Check by	Standardized measures	Implementation status			
		Management of medicine storage	☐ Sustained ☐ Not sustained		☐ Following STD ☐ Not following STD	
		Reduction of miscommunication between staff for reduction of wrong medication	☐ Sustained ☐ Not sustained		☐ Following STD ☐ Not following STD	

It does not matter either small KAIZEN or big KAIZEN. The most important thing is to have positive mindset (KAIZEN mind) and think of making things better continuously. Continuous small changes make things better and better, and possible to make big changes one day.

4.4. Total Quality Management (TQM)

Total Quality Management (TQM) is a participative, systematic approach to planning and implementing a continuous organizational improvement process[9]. Another way of saying that TQM may be defined as company-wide efforts or management to provide products and services that meet the need of customers rather than the production of homogeneous products and services[10].

The first large-scale attempt to introduce TQM to health sector was the National Demonstration Project (NDP) on TQM for Health, which was put into place in 1989 in the United States. It was an ambitious and revolutionary project aimed at making first use of the concept and methodology of quality control for the purpose of upgrading the quality of health and medical care services. However, The NDP successfully demonstrated that the TQM methodology is helpful for quality enhancement in hospitals as well as in other businesses[11]. Based on the NDP in USA, TQM was also tested in Japan's health sector and made successful implementation and there are some evidences obtained from NDP-Japan that TQM is useful for patient's safety and medical safety.

4.4.1. TQM Implementation

The definition of TQM can be illustrated as below in Diagram 35. Systematic approach of TQM needs to be developed based on the vitality of workplace and strong teamwork. Additionally, the concept of TQM must be well adopted in daily routine work.

Diagram 35: Systematic approach of TQM

Actual methodologies for TQM implementation are not difficult things. Vitalization of work place needs small group activity, statistical quality control and education of staff. Then, proper communication and information management will support the daily management of work. Finally, cross cutting way of team activities and approaches can manage all process of organization strategically.

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9   KALUZNY, McLAUGHLIN, SIMPSON,: Applying Total Quality Management Concepts to Public Health Organizations
10   HASEGAWA: A Study on Organizational Reinforcement through Total Quality Management
     in the Health and Medical Care Sector, 2006
11   HASEGAWA: A Study on Organizational Reinforcement through Total Quality Management
     in the Health and Medical Care Sector, 2006

4.4.2. TQM in Health services

TQM in health service is aimed at embedding awareness of quality in all processes in health service institution as shown in Diagram 36. The diagram indicates what health facility management team should consider.
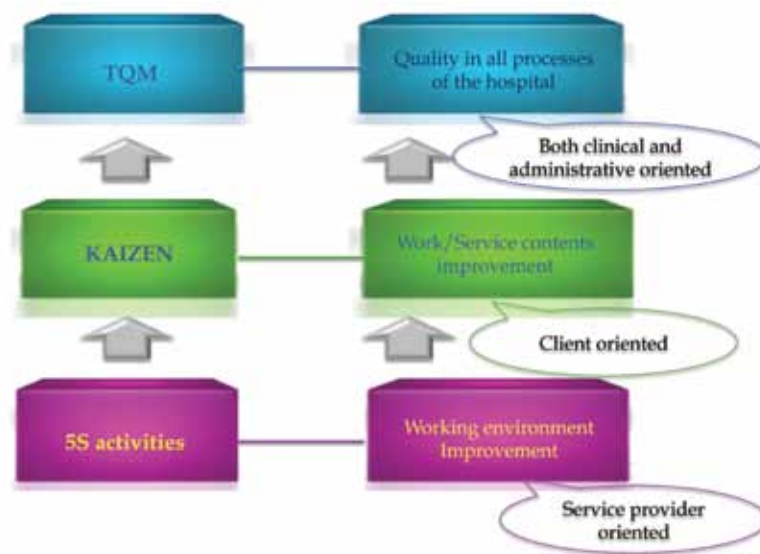
Diagram 36: From 5S to TQM, "What should be focused on"

At the beginning, consider creating good working environment to enable health workers to be competent towards providing high quality of services. Then, consider client satisfaction to improve clinical and non-clinical (responsiveness) issues with KAIZEN activities. Proceed gradually to TQM stage, resource management such as financial, human resource and medical supplies/equipment management should be considered. Moreover, patient's safety and staff safety issues need to be taken care of. Through all 3 steps approaches of 5S-KAIZEN-TQM, continuous provision of high quality health services can be achieved, and service users will recognize the health service institution as "Highly Reliable Organization" as shown in Diagram 37.

Diagram 37: TQM towered to "HRO"

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4.5. How to deal with resistance and implement KAIZEN activities

Change management of a system is bound to be difficult and complex in any organization. It is often to see slow down or stop KAIZEN activities. There are few characteristics observed behind the organization that slows down or stops KAIZEN activities. These include;

- Management of the organization prioritizes "profit" over customer satisfaction

- Management of the organization has weak leadership and hesitates to "change"

- Copy KAIZEN methodology and implement without proper understanding and adoption of the concept.

- Management of the organization does not recognize the importance of user-friendliness

Even though management of the organization has strong leadership and 5S-KAIZEN-TQM concepts are well adopted by managers, there are some organizations that slow down or stop KAIZEN activities. In this case, "resistance to changes" among workers is often the cause.

"Un-cooperative staff or resistant to changes" in your organization affect "cooperative staff" to have negative thinking and attitude on KAIZEN activities.

Often it has been observed that those "un-cooperative staff or resistant to changes" are senior staff of institution and usually those personnel are well experienced and skilled. Un-involvement of experienced and skilled personnel into KAIZEN activities is inexpedient as skills and knowledge of those personnel are very effective for quality improvement. Therefore, it is necessary to change mindset of "un-cooperative staff or resistant" on successful implementation of CQI (KAIZEN) activities. Here are the hints (box bellow) for how to change mindset of un-cooperative or resistant staff:

Hints for how to change mindset of resistant workers

- Show example and explain effectiveness and necessity of 5S using data, pictures etc.
- Remove "unnecessary work" from current workflow
- Remove variability of work (Equalization/Leveling)
- Make work procedure clear and develop Standard Operating Procedures (SOPs)
- Explain what we can do if 5S is introduced

Once resistance to "change" is reduced, managers should aim to build mutual understanding and communication mechanism between management and other workers. As previously mentioned, QIT and WIT are very important for development of this mechanism. To run the communication mechanism, it is important to respect humanity and keep hash out until you have consensus between management and other workers.

For successful implementation of 5S-KAIZEN-TQM and other QIPs, changing the attitude of all health workers is cornerstone. Staff should be encouraged to perform 5S in their mind and brain as summarized in boxes (a) and (b).

Tips for successful 5S implementation (a)

"5S of the mind"
5S is usually used for "things", however, it is important to implement "5S in your mind" for practicing 5S activities appropriately:

- **Sort** your mind to concentrate on your work
- **Set** your mind to organize your work
- **Shine** and **Standardize** your mind to enjoy your work and maintain you way of working
- **Sustain** your mind to carry out your work actively and maintain your work quality

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Doing 5S of the mind and brain is very important for changing your attitude in positive way and accelerates 5S implementation appropriately.

Tips for successful 5S implementation (b)

"5S of the brain"
- **Sort** in your brain is to clarify your work on what / for whom / what purpose / how and by when
- **Set** in your brain is to prioritize you work
- **Shine** in your brain is to manage your work one by one
- **Standardize** in your brain is to remove barriers of managing your work
- **Sustain** of your brain is to solve problems and execute your work continuously

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4.6. 5S-KAIZEN-TQM as Foundation of all QI Program

Implementation of 5S-KAIZEN-TQM will serve as a foundation of all other QIPs. The photographic baseline assessment is a yardstick to show other hospital staff the real situation. This also will stimulate the hospital staff towards an urge to reject the status quo. From this point, the 5S principles are implemented starting with few targeted areas and use the results from these areas; to win support from the remaining areas to implement the 5S principles.

On top of improvement of the work environment with 5S implementation; then other QIPs can now come in to improve various aspects of quality in health services, patient and staff safety. Re-assessment is done using the 5S-KAIZEN M&E sheet (Annex 2) to maintain 5S-KAIZEN practices, and also other tools such as the Hospital Performance and Self Assessment Tool (HPSAT), IPC checklist can be used as a more comprehensive tool covering the technical issues.

It is important for all health workers to know that 5S-KAIZEN-TQM should be implemented continuously even other QIPs are introduced. This will facilitate quick realization of outcome and impact of quality improvement activities introduced in health facility. The implementation of relationship between 5S-KAIZEN-TQM and other QIPs is shown in Diagram 38.
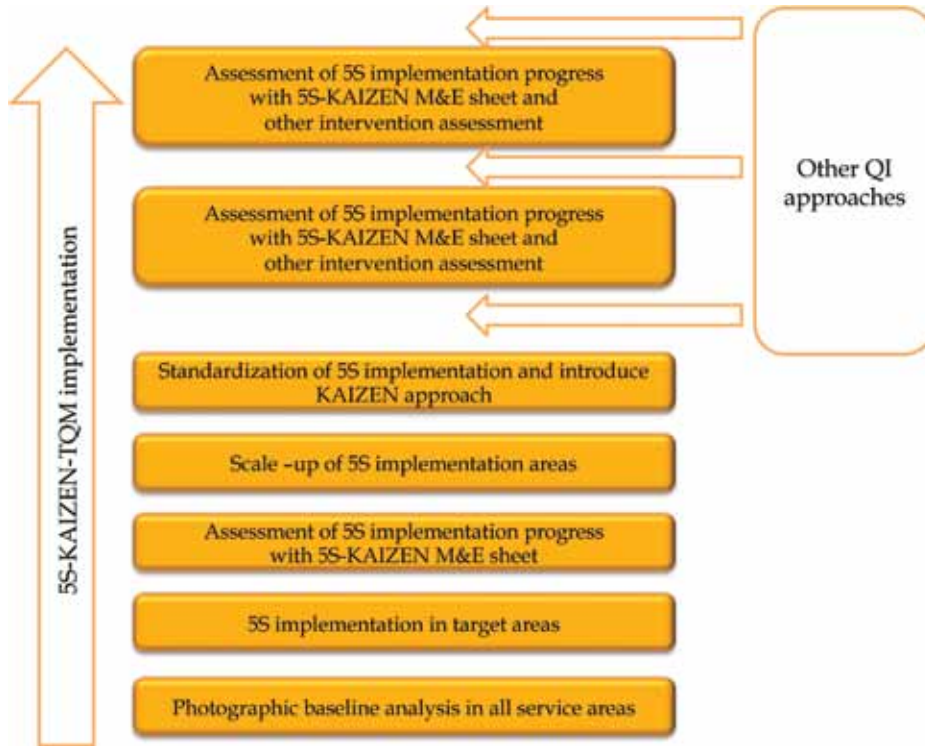
Diagram 38: 5S-KAIZEN-TQM as a Foundation of all other QIPs

Chapter 5:

Five-S (5S) tools for actual implementation

"5S tools" are developed to help practice of 5S activities. Those tools are usually used for implementation of S1 (Sort), S2 (Set) and S4 (Standardize). 5S tools can be combined to enhance effectiveness of 5S activities. All tools require an agreed set of rules, and all staff working in the health facility must know those rules and everyone should follow the rules.

5S tools that will be described in this chapter are; 1) Alignment, 2) Numbering/Alphabetical coding, 3) Red tag, 4) Safety signs, 5) Color coding, 6) Sign board/Mapping, 7) Labeling, 8) Symbols, 9) X-Y axis, 10) Zone, and 11) 5S corner. Additionally, Visual control method is also explained in this chapter.

5.1. Five-S (5S) tools

5.1.1. Alignment

This is used for S2; "SET" activities to organize files, equipment, materials and other things in order to improve orderliness and beautification. The two pictures below give a case example of alignment in one of the hospitals in Tanzania implementing 5S.

Bed alignment

Holder alignment

5.1.2. Numbering/Alphabetical Coding

This is used for S2; "SET" activity. This is to organize files and other items by numbers / alphabets (see the two pictures below from one hospital in Tanzania. It helps users to find necessary things or information quickly and easily. It is very useful for practice of *"Can See-Can Take Out – Can Return"* principle. It requires an agreed set of rules, or a central coordinator to maintain system.

Open register file with alphabetical code

Patient's medical record with numbering

5.1.3. Red Tag

This tool is used for S1; "SORT" activities. When some items are difficult to decide, whether it is necessary or unwanted items during Sort practice. Put Red Tag on the item, which is difficult to make decision whether it is necessary or not necessary, and observe for a month. If you didn't move or use the items for a month, it means these items are "may be necessary" OR "unnecessary" for the current workflow.

Example of Red tag

Red tag place on unnecessary equipment

5.1.4. Safety signs

This tool is used for S2; "SET" and S4; "STANDARDIZE" activities. This is used to warn visitors and workers to pay attention on hazardous items or areas.

Some safety signs are internationally recognized and can be applied in health facilities. Therefore, it is recommended to use common safety signs. If there are no internationally / nationally recognized safety signs for particular items or areas, health facility can develop own safety designs. The picture below shows some examples of common safety signs.

Safety sign on workshop door

Safety sign on laboratory wall

5.1.5. Color coding

This tool is used for S2; "SET" and S4; "STANDARDIZE" activities. The tool is used for making facility users ad visitors understand the meaning of something with different colors. It is often used for facility identification, segregation of medical wastes, and hospital linen by type. It can also be used for categorization of areas/zones, identification of gas cylinders (full or empty) and so on. Refer to the National Infection Prevention and Control Guidelines and Healthcare Waste Management Standards, policy and guidelines will help you to understand and accepted national color-coding for different types of wastes.

Color coding for cleaning tools

Color coded waste bin for waste segregation

5.1.6. Signboards / Mapping

This tool is use for S4; "STANDARDIZE" activities. This is used for identifying the location of places and guiding facility users to the place where they want to visit. Use common languages that are understood by all; in this case Kiswahili and English are feasible in Tanzania.

Ward signboard

RCH Clinic signboard

5.1.7. Labeling

This tool is used for S2; "SET" activities. This is used for visual communication to identify items and organize them properly for quick finding, proper storage as well as management of items. Labeling can be standardized for easy finding of items and proper storage place for each items.

Labeling of files

Labeling of medication in ward store

5.1.8. Symbols

This tool is used for S2; "SET" and S4; "STANDARDIZE" activities. This is used for visual communication to make everyone to understand the meaning of something by marks/symbols without or minimum explanation.

Wheel chair parking with symbols

Stretcher parking with symbols

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5.1.9. X-Y Axis

This tool is used for S2; "SET" activity. This is used for improvement of orderliness and beautification; this is often used for information and poster display on notice board. X-Y Axis is also used to apply other 5S tools such as safety sign, direction boards, symbols and labeling.

Disorganized notice board

Organized notice board with X-Y axis

Organized notice board with X-Y axis

Organized notice board with X-Y axis

5.1.10. Zone

This tool is used for S2; "SET" and S4; "STANDARDIZE" activities. This is used to identify or recognize the proper location or storage of items. This helps people to understand "Where it is supposed to be kept or parked".

Stretcher and wheelchair parking with zoning

Place for waste bins with zoning

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5.1.11. 5S Corner

This is effective for S5; "SUSTAIN" activities. Utilize existing notice board or establish new notice board apart from existing notice board. There are three types of 5S corner:

1) 5S corner for all hospital staff at administration block

2) 5S corner for visitors (patients, care taker etc.) at OPD waiting room, corridor

3) 5S corner for all departments/wards staff at each department/ward

On the 5S corner, the following information is displayed;

- 5S posters,
- Pictorial progress report,
- Implementation progress chart/table
- Monitoring and Evaluation information (target areas, schedule, method)
- Training information (target personnel, schedule, venue, topics)
- QIT/WIT Meeting information (schedule, venue, agenda)
- Mission statement on quality improvement
- Information on waste bin color coding and type of waste

Table 13: clarifies what kind of information should be displayed on which type of 5S corner:

Information on 5S corner	Types of 5S corner		
	Administration	OPD Waiting/Corridor	Dept./Ward
5S posters	Y	Y	Y
Pictorial progress report	Y	Y	Y
Implementation progress chart/table	Y	NA	Y
Evaluation information	Y	NA	Y
Training information	Y	NA	Y
QIT/WIT meeting information	Y	NA	Y
Mission statement on quality improvement	Y	Y	Y
Information on waste bin color coding and type of waste	Y	Y	Y

Y: necessary to display   NA: Not applicable

Example of 5S corner at Administration

Example of 5S corner at department/ward

5.2. Use of 5S tools for enhancement of Visual Control

5.2.1. What is Visual Control?

Visual control refers to means, devices, or mechanisms that were designed to manage or control our operations (process) so as to meet the following purposes:

- Make the problems, abnormalities, or deviation from standards visible to everyone,
- Enable corrective actions to be taken immediately, such as:
    - Displaying the operating or progress status in a easy to see format.
    - Providing instruction.
    - Conveying information.
    - Providing immediate feedback to people.

5.2.2. What are potential benefits of Visual Control?

Implementing visual control in the hospital would help health workers in exposing abnormalities, problems, deviations, waste, unevenness, and unreasonableness to facility users, thus corrective actions can be taken immediately to:

- Solve the problems,
- Reduce operational costs,
- Reduce possible waste,
- Shorten services lead-time and thus keep the delivery of services on time.
- Reduce inventory.
- Ensure a safe and comfortable working environment.

5.2.3. Practicing of Visual Control

The main purpose of visual control is to organize the working area such that facility users can tell whether things are going well or are amiss without the help of expert. Visual control can be implemented using either the actual or analog items.

Actual items:

- Designate a location (position) for each item.
- Indicate quantity (or maximum level of inventory)
- Distinguish item from each other.
- Specify form (document).

Analog items:

- Colors
- Shapes (contour)
- Symbols
- Characters (verbal)
- Numbers
- Graphs/tables

The following table 14 shows the example of usage of 5S tools that will help to enhance visual control within a health facility. _It is reminded that all tools require an agreed set of rules._ Often color coding and symbols have international rules or regulation that are well known by people. In that case, it is better to use rules that are adopted by majority of people.

All the rules must be informed to all staff in the health facility and everyone must follow the rules. Displaying the rules on 5S corner or notice board is helpful for everyone to remind the meaning of colors or symbols. Table 14 shows how 5S tools can be used for visual control.

Table 14: Example of usage of 5S tools for visual control

Analog items	5S tools	Example of usage	Actual items
Colors	1. Color coding	1.1 Waste bin for infectious and general waste (IPC guideline) 1.2 Disinfectant containers 1.3 Linen system 1.4 Oxygen tank storage (full-blue, empty-red)	Distinguish item from each other
Shapes	2. Zoning	2.1 Marking of stretcher/wheel chair parking, 2.2 Car parking 2.3 Position of waste bin	Designate a location
Symbols	3. Symbols	3.1 Indication of stretcher/wheel chair parking, 3.2 Toilet, 3.3 No smoking area 3.4 Dangerous areas (high voltage, incinerator	Distinguish item from each other
Characters	4. Alphabet coding 5. Labeling 6. Signboard	4.1 Open registry files keeping, 5.1 Store/stock management for medical supplies 6.1 Direction to facilities in hospital 6.2 Identification of facilities in hospital	Designate a location
Numbers	7. Numbering	7.1 Medical records keeping, 7.2 Administration files keeping	Designate a location
Graphs/ tables	8. Checklist 9. X-Y Axis	8.1 Progress report, evaluation result 9.1 Notice, poster display on notice boards/5S corner	Specify form (Document) and indicate quantity

5.2.4. Examples of Visual Control

Here are some good examples of Visual Control methods applied in public hospitals in Tanzania. Many of them are used for stock control of stationaries, medicines and medical supplies.

Stock control of report format

Stock control of report format

Stock control of medicines at OPD

Stock control of supplies
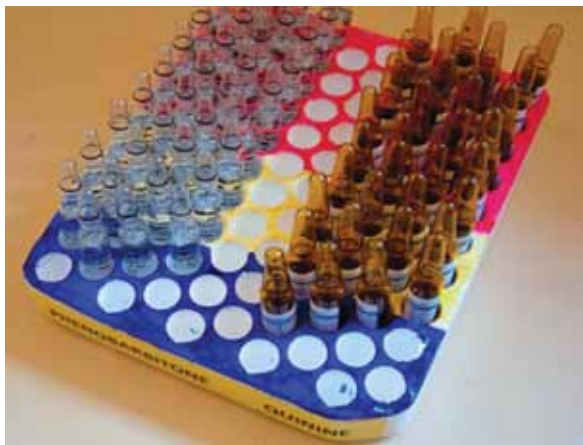
Stock control of medicines at ward

Stock control of medicines at ward

Control of movement at entrance
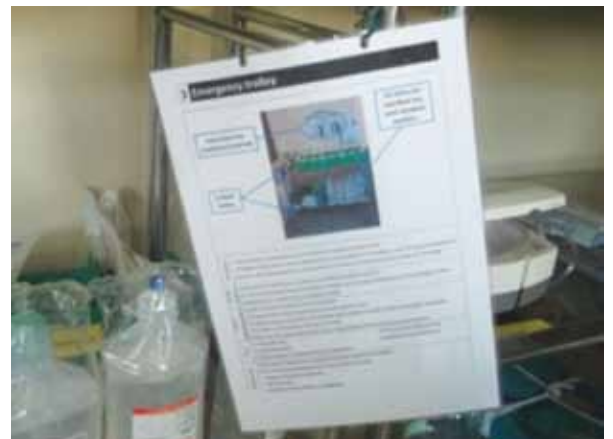
Visual control by picture for arrangement of trolley

However, Visual control can be applied much more in hospital setting. For example, process of doctor's consultation can be developed using flow chart or diagram, which can instruct visitors how to see a doctor. This can reduce time for verbal explanation to guide patients and visitors following proper procedures. Not only for patients and visitors but it can used for staff to follow different procedures such as hand washing, management of medical waste, sterilization of operation and treatment tools and equipment and so on.

Hand washing procedures

Procedures for sterilization (CSSD)

Visualization of work processes can also help health managers and workers to understand work relation with other sections and departments. Moreover, it will help to review all processes and improve procedures for cost and time reduction to get services or outputs.

Chapter 6:

Quality Control (QC) tools

There are several QC tools used for evidence-based quality improvement, KAIZEN. Among those tools, it is necessary know about basic seven (7) QC tools and new Seven (7) QC tools that can be utilized for KAIZEN Process. Those tools are listed in table 15; and in this chapter, tools that are often used during KAIZEN process are explained in details.

Table 15: List of QC tools

	Basic 7 QC tools (Bold = Often Used)		New 7 QC tools (Bold = Often Used)
1	*Cause-and-effect (fishbone diagram)*	1	*Affinity Diagram*
2	*Check sheet:*	2	*Interrelationship Diagraph*
3	*Control charts:*	3	*Tree Diagram*
4	*Histogram:*	4	*Prioritization Matrix*
5	*Pareto chart:*	5	*Matrix Diagram*
6	*Scatter diagram:*	6	*Process Decision Program Chart*
7	*Stratification:*	7	*Activity Network Diagram*

6.1. Pareto chart

Pareto chart is a type of chart that contains both bars and a line graph, where individual values are represented in descending order by bars, and the line represents the cumulative total.

The left vertical axis is the frequency of occurrence, but it can alternatively represent cost or another important unit of measure. The right vertical axis is the cumulative percentage of the total number of occurrences, total cost, or total of the particular unit of measure. Because the reasons are in decreasing order, the cumulative function is a concave function. To take the example above, in order to lower the amount of late arriving by 80%, it is sufficient to solve the first three issues.

The purpose of the Pareto chart is to highlight the most important among a (typically large) set of factors. In quality control, it often represents the most common sources of defects, the highest occurring type of defect, or the most frequent reasons for customer complaints, and so on.
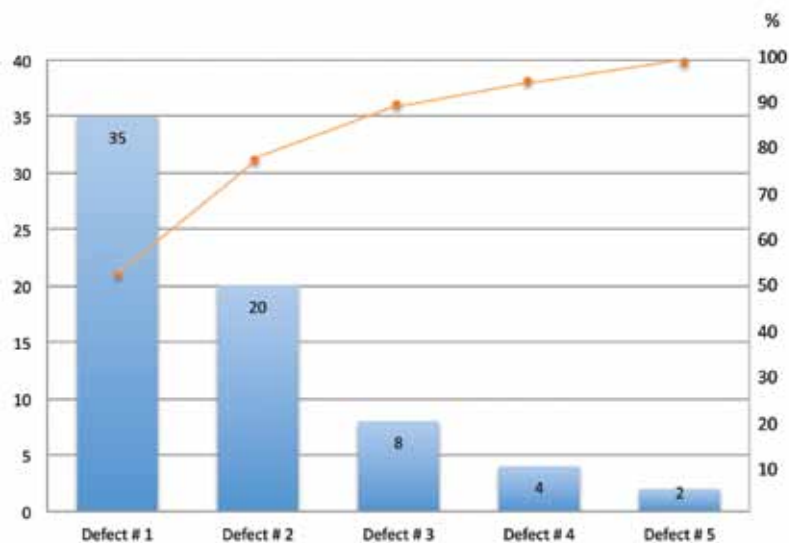
6.2. Fish bone diagram (Cause and Effect diagram)

The cause and effect diagram is used to explore all the potential or real causes (or inputs) that result in a single effect (or output). Causes are arranged according to their level of importance or detail, resulting in a depiction of relationships and hierarchy of events. This can help you search for root causes, identify areas where there may be problems, and compare the relative importance of different causes.

Causes in a cause and effect diagram are frequently arranged into major categories. While these categories can be anything, you will often see: manpower, methods, materials, and machinery used in manufacturing sector. On the other hand, equipment, process, people, materials, environment and management are often used in social or service sector.
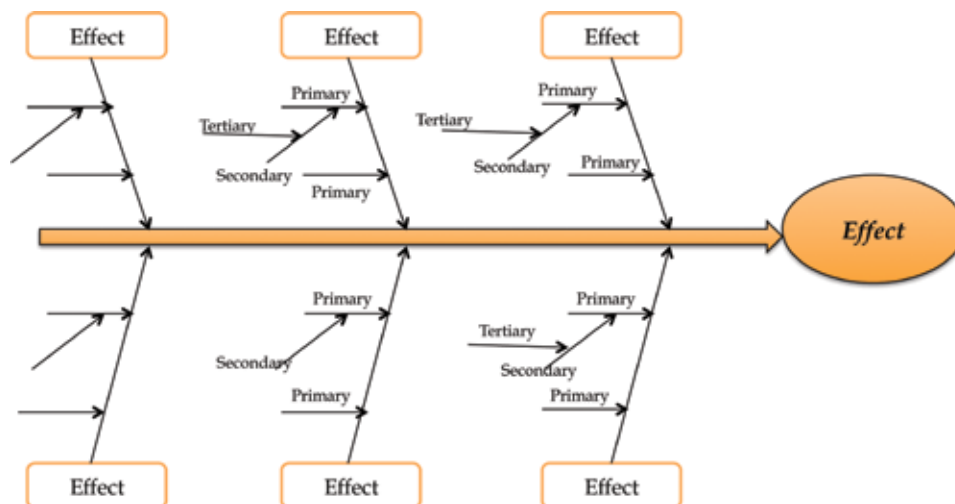
6.3. Tree diagram

This tool is used to break down the causes called "Why-Because analysis" and to segregate the contents in the issues. The participants need to develop the diagram to think their idea from generalities specifics. On the other hand, the tree diagram is also utilized to identify the actual countermeasures against selected problems and it is called "If- Then analysis". Example of "If- Then analysis is shown in diagram 29 in Chapter 4
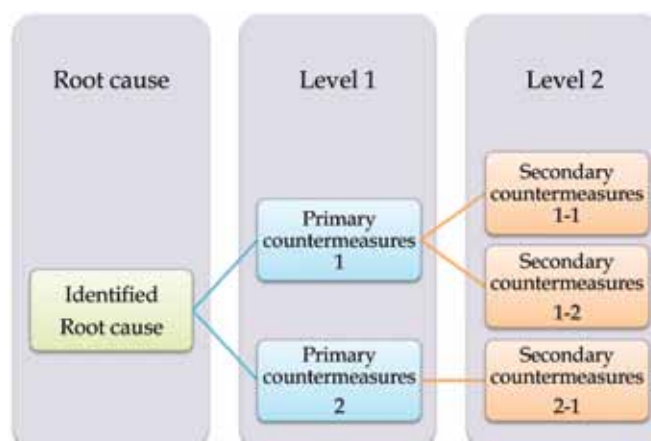
6.4. Matrix diagram

This diagram is used to analyze the problem in the target by two additional factors, arranged in two-dimensional matrix. At each intersectional relationship is either absent or present. It then gives information about the relationship, such as its strength, the roles played by various individuals or measurements.
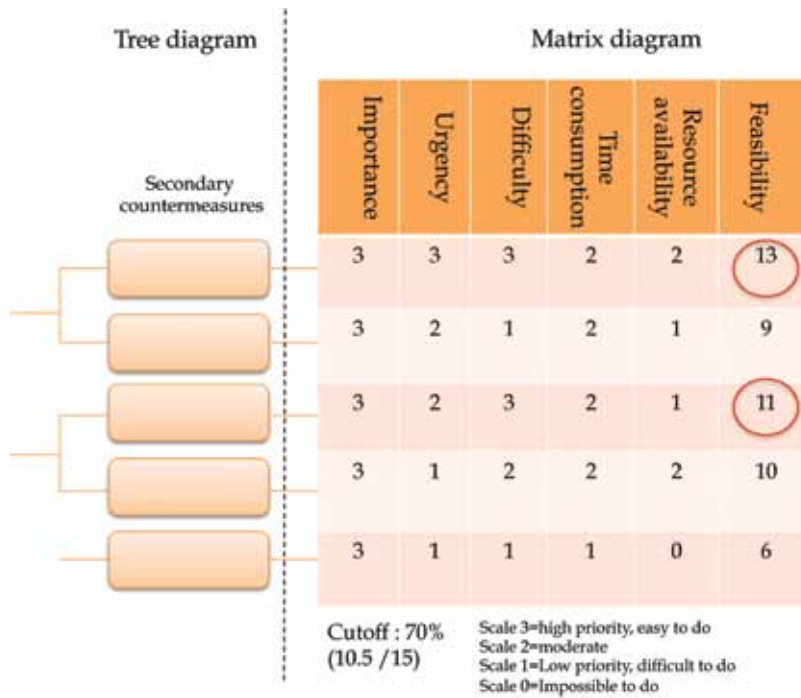
6.5. Histogram

Histogram is a graphical display of tabular frequencies and density of the data similar to bar chart. Each bar is erected over an interval, with an area equal to the frequency of the interval. The height of a bar is also equal to the frequency density of the interval. The total area of the histogram is equal to the number of data. The histogram visualizes the trend of the data such as average, median, mode and out-layers.
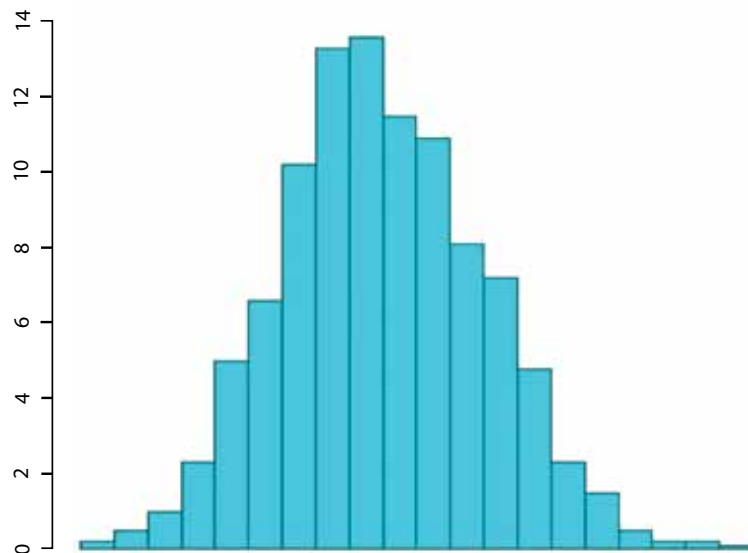
6.6. Control charts

Control charts, also known as Shewhart charts, in statistical process control are tools used to plotting data on time line (horizontal or X-axis) and to visualize whether the plotted data is in between upper control line and lower control line or not and how the plotted date is similar to standard line. The control charts make easy to monitor the activities in KAIZEN by deciding the capability of the process, and identifying special causes. There are different types of control charts depending on the type of data you have collected.

69
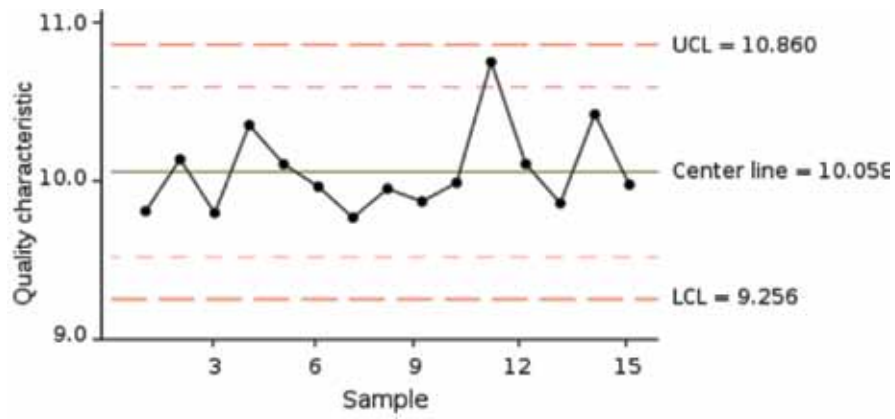
6.7. Scatter graph

Scatter graph is a type of mathematical diagram to display values for two variables for a set of data. The data is displayed as a collection of points, each having the value of one variable determining the position on the horizontal axis and the value of the other variable determining the position on the vertical axis. Based on the scatter diagram, a regression curve shall be induced.
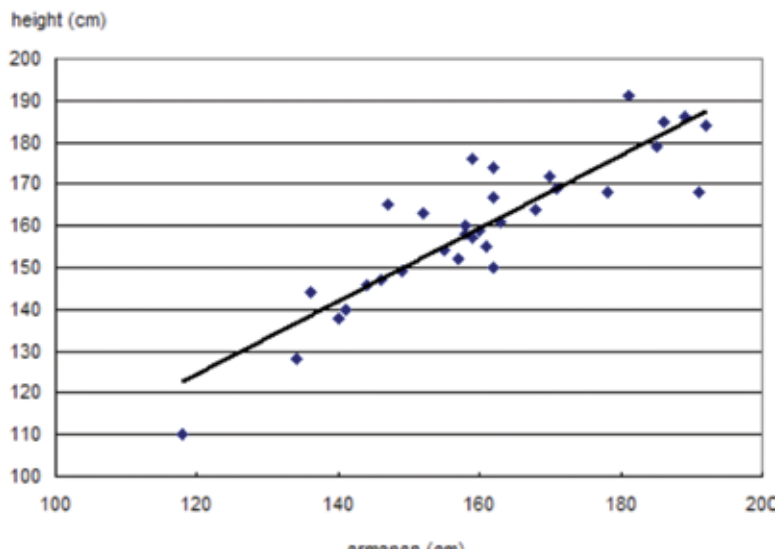
Chapter 7:

Monitoring and Evaluation of 5S-KAIZEN-TQM activities

7.1. Introduction

Monitoring and evaluation (M & E) is an integral component of quality improvement in health services. Health managers, in-charges of hospitals/departments, program managers/staff, and other health workers; they need to know about M & E. In this case they need not to be experts of it but just the basics of M & E are adequate; including data collection, processing, analysis, and use.

The knowledge about M & E helps health workers in the health sector to effectively monitor and evaluate their health facilities or program; and hence strengthens the performance. This chapter aims at highlighting the M & E essentials for the implementation of 5S-KAIZEN-TQM, as a foundation of all other QI approaches in the country.

7.2. What is Monitoring and Evaluation?

(a) Monitoring;

   (i) Monitoring refers to an on-going activity to track progress in implementation of activities in a health facility or program, against planned tasks. Data are systematically collected, analyzed and used to provide information to policy makers, health managers, directors, in-charges, program managers and others (including stakeholders), for use in planning and management.

   (ii) Monitoring aims at providing regular feedback and oversight of implementation of activities in relation to plans, resources, infrastructure, and use of services by the community served.

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

7.3. Importance of Monitoring and Evaluation

Monitoring and Evaluation (M&E) is crucial in QI programs/approaches. It is particularly so due to the fact that it:

• Assists health managers, directors, in-charges, program managers/staff, and others in he health sector in performing the day-to-day management of health facilities and programs.

• Provides information for strategic planning, design and implementation of health interventions and programs.

• Assists in making informed decisions on the prudent use of meager 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 in the desired outcomes.

- Assists to better the human condition in terms of safe working environment, and improved health status.

- Puts up a system for transparent accountability.

7.4. Interaction between5S-KAIZEN-TQM implementation and M & E

The diagram 39 shows the phases for implementation of 5S-KAIZEN-TQM activities and how the M & E comes in. There are two things depicted here, which need to sit at the back of the mind of health workers; firstly, M & E is a continuous process; and secondly, the 5S activities are never one time implementation, they should be done on daily basis.
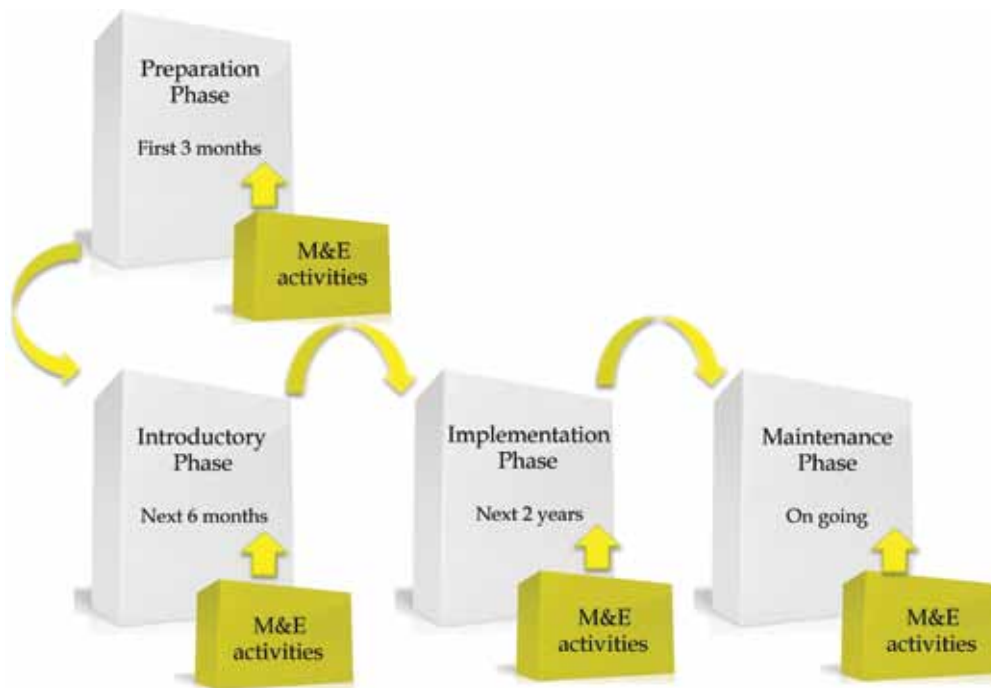
Diagram 39: Interaction between5S-KAIZEN-TQM and M&E

The 5S-monitoring sheet in annex-1 should be used to monitor 5S activities. The result of monitoring should be shared between QIT and WIT for further improvement. QIT should use "Action plan"(see format in annex-2) and see "how many activities are achieved out of the target". Once you move to KAIZEN process, number of KAIZEN memo and achievement of KAIZEN plan will also be used for evaluation of QIPs.

7.5. Tanzanian 5S-KAIZEN-TQM Logical Framework

Logical framework is a diagram, which visualizes the factors that drive an intervention. The framework links 5S-KAIZEN-TQM approach to the desired impact (i.e. QI in health services). It incorporates some key contextual factors for successful implementation of 5S-KAIZEN-TQM as shown in Diagram 40

Diagrame 40: Tanzânia 5S-KAIZEN-TQM Log Frame

7.6. Monitoring of 5S-KAIZEN-TQM approaches

7.6.1 External consultation (Monitoring and evaluation) visit

This refers to external consultation by experienced national facilitators to monitor the progress of implementation of 5S-KAIZEN-TQM approaches. The facilitators combine supportive supervision skills and coaching to improve the skills of staff in implementing areas visited. The progress is evaluated with various tools contained in this guideline (coupled with criteria of marking given as separate sheet to facilitators). As immediate action feedback is given to QIT and HMT together with presentation of the topic areas that need to be improved.

 MoHSW and Regional Health Management Teams (RHMTs) organize consultation visit to the hospitals that are implementing 5S-KAIZEN-TQM approaches every 6 months. During the consultation visit, a team of experts obtains information from Hospital Management Team (HMT), Quality Improvement Team (QIT) and Work Improvement Team (WIT) on the following points:

- Implementation structure,
- Dissemination and training activities,
- Internal monitoring and evaluation activities
- Dialogue between HMT and QIT, QIT and WITs
- Budget of 5S-KAIZEN-TQM approaches implementation
- Changes and improvement

Consultation visit team is also evaluating progress of 5S-KAIZEN-TQM practices with standardized 5S-KAIZEN M&E sheet, which is developed by MoHSW and JICA (see Annex 2).

Consultation visit team organizes feedback session, and the results of evaluation are presented to QIT and WITs for further improvement. Note that guideline for Consultation visit is also available for the people implement the Consultation visit.

> **NOTE:**
>
> At health facility level, the QIT and HMT will be providing supportive supervision to the implementing areas using coaching and mentoring skills. The RHMTs will be providing supportive supervision with coaching and mentoring on 5S-KAIZEN-TQM approaches to Regional Referral Hospital and build capacity of CHMTs; while CHMTs will be providing supportive supervision with coaching and mentoring on the approaches to district hospitals, health centers and dispensaries. As rollout continues, challenging areas identified during the external consultation (monitoring) visit will be addressed by using national facilitators in the nearby regions to work as mentors.

7.6.2 Progress Report Meeting

The MoHSW organizes a meeting to receive reports on progress of 5S-KAIZEN approaches implementation every 6 months. There are parts of the series of the interventions shown in Diagram 41.

This is called *"Progress Report Meeting on 5S-KAIZEN-TQM approaches"* and all 5S-KAIZEN implementing hospitals are invited to present their progress of activities. In the past, power point presentation, lectures, discussion and practice methodologies were used for training and rolling out of the approach. However, sudden increase of number of the hospitals implementing 5S-KAIZEN, different style will be applied for smooth implementation of PRM
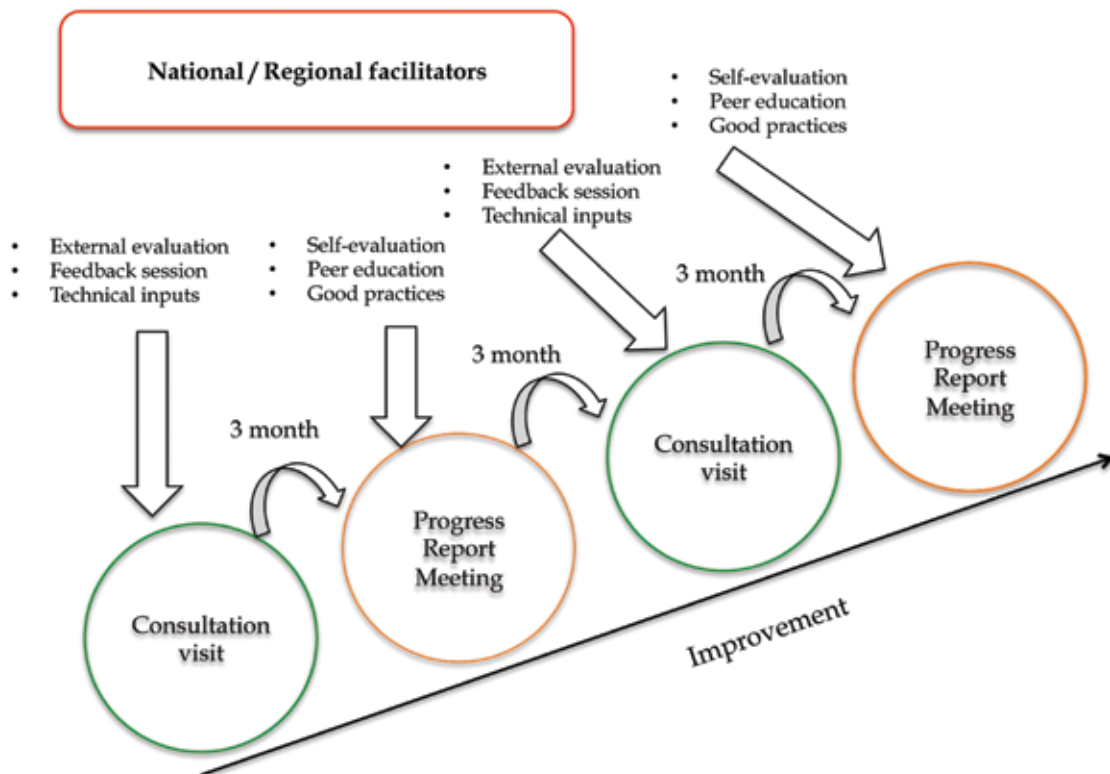
Diagram 41: Series of intervention

7.6.3 Internal Monitoring and Evaluation by QIT/WIT

7.6.3.1. QIT

QIT has responsibility of conducting monitoring and evaluation of 5S activities within the hospital. QIT should monitor and evaluate their own performance and visit the section(s) or department(s) that is/are practicing 5S-KAIZEN-TQM activities periodically. This kind of visit and exchange opinions with WIT is important to find problem(s) and have ideas of solutions. Provide technical support/advice, mentoring or coaching, if necessary. Points of monitoring and evaluation are as follows:

- Organizational leadership and ownership
- Strategy development
- Performance of Sort, Set, Shine, Standardize and Sustain activities; and
- Performance of WITs

Note that organizational leadership and ownership and performance of Sort, Set, Shine, Standardize, and Sustain activities are evaluated by using the sheet attached in annex-1. If 5S activities are in place and became a culture of the health facility (maintenance phase), consider going for next step and monitor and evaluate the issues for TQM achievements. Indicators vary from hospitals to hospital. Thus, select indicators that match with your health facility considering issues such as:

- Hospital health care delivery system
- Health care result such as "coverage of a health intervention", "hospital mortality and morbidity rate"
- Financial results such as "cost performance"
- Human resource result such as "retention rate"

7.6.3.2. WIT

Work Improvement Team (WIT) has responsibility for conducting monitoring and evaluation of day-to-day 5S practices and KAIZEN activities that are suggested and executed within their work place. Process of 5S + KAIZEN activities must be documented and share the results within the department/sections. The WIT will also communicate the results to the hospital QIT; and WIT should develop their own checklist to suit their work environment.

7.6.4. Record keeping of M&E information

Record keeping of all M&E activities is very important for continuous improvement.

As mentioned in the sections 7.6.1 and 7.6.3, external party or internal QIT carries out different kinds of M&E activities. Therefore, QIT of hospital shall keep important information, reports, pictures and other materials to use them for further improvement.

The following items must be kept at QIT office:

- Pictures showing before 5S and after 5S, and pictures of the progress every 3 months
- External and internal evaluation results for comparison
  - Radar charts by sections/departments
  - 5S-KAIZEN M&E Calculator with section/department results
- Minutes of monitoring activities
- Suggestions and recommendations from WIT and other staff for improvement
- External evaluation report (Consultation Visit report)

From the past experiences, information, pictures were often destroyed by computer viruses. Therefore, it is strongly recommended that all records shall be kept in compact disks (CDs) with proper mention of date and years. Then, keep them in file cabinet, where every QIT member access. The CDs must be handled appropriately to avoid damage. Also, the HMT and QIT, should make efforts to ensure that all computers have up-to-date antiviruses for safety of documents stored.

7.6.5 Tools used in monitoring the 5S-KAIZEN-TQM approaches

To ensure effective implementation of the 5S-KAIZEN-TQM Approach, several tools have been developed and others modified to suit the situation on the ground. The tools are as follows:

- 5S-KAIZEN-TQM Monitoring and Evaluation sheet (annex-1);
- Action Plan Format (annex-2);
- KAIZEN Progress checklist (annex-3);
- Progress Report Format (annex-4);
- KAIZEN Process Checklist (annex-5);
- Five-S Activity Good Practice Sheet (annex-6a); and
- Example of Good Practice Sheet (annex-6b).

7.6.6. 5S-KAIZEN (CQI)-TQM M & E Information Flow System

Information flow and sharing is an essential component of M & E. The management structure at regional level (RHMTs) is given a critical role of coaching and supervising the CHMTs and Regional Referral Hospitals. They will also ensure quality data from lower levels are available and communicated to the national level coordinating unit. Consultant and specialized hospitals will directly communicate to the national coordinating unit. The national coordinating unit will also from time to time communicate directly to the regional hospital QITs. The information flow system is illustrated in Diagram 42.
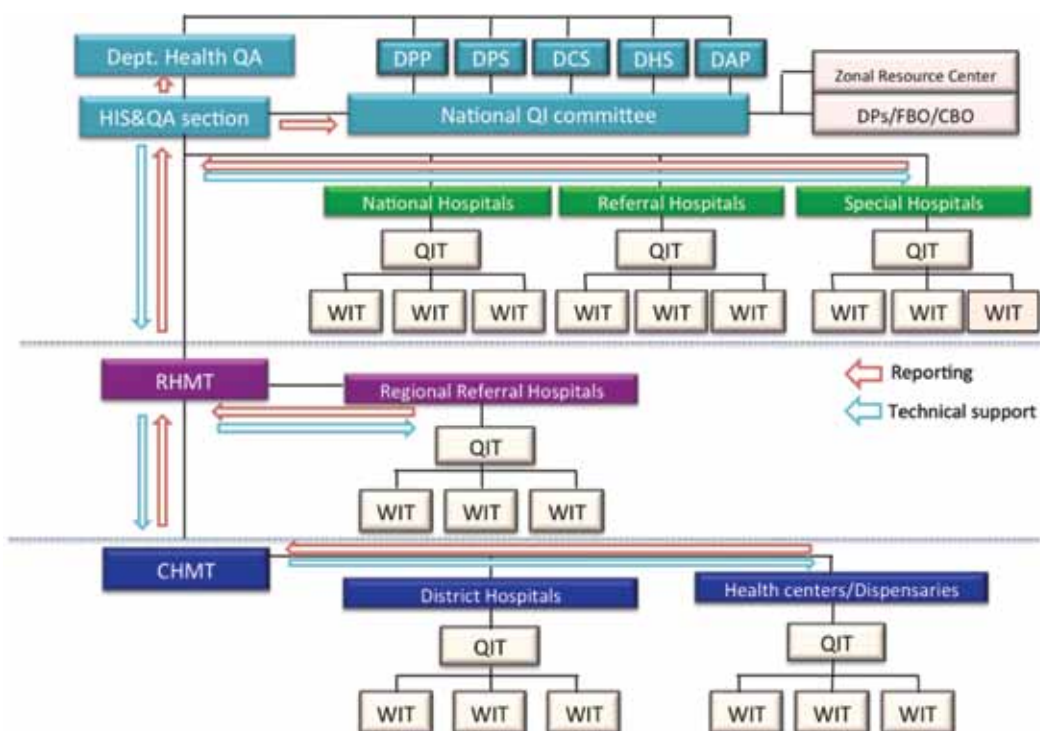
Diagram 42: Envisioned M & E information flow in 5S-KAIZEN-TQM implementation

7.7. Recognition and Competition

7.7.1 Description of the two schemes

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

People often confused between "Recognition" and "Competition". They are two different issues. "Recognition" is a process and continuously implemented to recognize achievement for certain level of performance and maintenance of the condition. However, "Competition" is to compete level of performance among teams, groups or individuals, and ranking of competitors make difference of benefits.

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.

The difference between the two schemes are;

- No ranking in "Recognition" scheme. Team or individual achieves certain level of performance and maintained the performance in certain period will be recognized based on set criteria and standards.
- There is ranking in "Competition" scheme. Competitors will be judged 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".

7.7.2 Implementation at Health Facility and National Levels

(a) At Health facility Level

In actual implementation of the two schemes at health facility level, 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 everyone of the team member, gets 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 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. In these guidelines, recognition and/or competition and awarding have been captured in several sections where it is necessary in order to ensure effective and sustainable implementation of 5S-KAIZEN-TQM approaches as follows:

- Characteristics of HROs (section 3.1.3);

- Phases of 5S implementation (table 5);

- Work Improvement Team establishment and its performance (step-7 in the introductory phase);

- Changing staff mind-set towards KAIZEN activities (in Heijyunka – "equalization" as part of standardization);

- As one of activities in Shitsuke - "sustain" in step-10: making 5S activities a culture of your facility;

- As one of the four conditions for successful KAIZEN (section 4.2.3); and

- As a method in KAIZEN system (table 6);

(b) At National Level

The MoHSW 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 ach categories.

(c)   Role of CHMTs and RHMTs in recognition and competition

The CHMTs will be responsible for overseeing recognition and competition of primary health facilities (health centers and dispensaries) under close collaboration with RHMTs. Results of the two schemes implemented by CHMTs will be shared with the RHMTs and the HSIU. The RHMTs being the extended arm of the MoHSW, will work in close collaboration with HSIU to oversee the implementation at Regional and District Levels. All the RHMT members will have all the necessary skills in supervision, consultation and assessment of 5S-(CQI) KAIZEN-TQM implementation.

7.7.3. Awards issues in Tanzanian Health Sector

National awarding event was started from 2011 to encourage the hospitals implementing 5S activities as well as national facilitators, who commit supporting health institutions for implementation 5S-KAIZEN implementation.

 The following awards related with 5S-KAIZEN-TQM activities are as follows:

1. **Most Progress Award 1st prize ~ 3rd prize**

    This award is made to hospitals that are practicing 5S-KAIZEN well. It is judged based on annual average of Consultation visit compared with previous year to see the progress.

2. **KAIZEN Award 1st prize ~ 3rd prize**

    This award is made to hospitals that are practicing KAIZEN well and have KAIZEN success stories to improve productivity, safety, financially etc. Hospitals that are applying for the award must submit complete KAIZEN cases (complete till Step 7 and have good effects) with proper record, and it will be judged based on procedures and effects of KAIZEN activities.

3. **Best facilitator Award**

    This award is made to national facilitators and CV consultants, who contribute the series of events related with national rollout and sustainability of 5S-KAIZEN-TQM approaches.

4. **Best Visual Control Award**

This award is made to hospitals that are introducing Visual Control method for managing workplaces, stocks, procedures etc. Hospitals that are applying for the award must submit pictorial records of Visual control on Good Practices Sheet format with the explanation of before and after introduction of the Visual control method. it will be judged by participants of progress report meeting.

Annex 1

Action plan format

Quality Improvement Action Plan with 5S-CQI (KAIZEN)-TQM

For

(Name of your institution/hospital)

Developed by……………………………

Date…………………………….

1.   Issues and challenges of the Region/District

2.   Institutional Analysis

Overall situation of the facility:

Areas/Sections/Departments	Problems	Expectation of service users

3.   Problem Statement

4.   Goal

5.   Objectives

Objectives and Outputs	Indicators	Means of Verification

6.   Target area(s) for implementation of 5S

7. Action Plan

Phase of implementation	Activity for improvement	Target	Resources input	Time Frame 20…. 1	2	3	4	20…. 1	2	3	4	Responsibility	Means of Verification
Preparatory Phase Activities that are implemented in first three months													
Introduction Phase Activities that are implemented in next six months													
Implementation Phase Activities that are implemented in next two years													
Maintenance Phase Activities that are implemented an on going base to maintain the previous phases													

Annex 2

5S-KAIZEN M&E Sheet

MONITORING AND EVALUATION SHEET FOR THE PROGRESS OF 5-S ACTIVITIES

	Ver. 2012-September						Date: / /
	HOSPITAL:		DEPARTMENT:				
	DESCRIPTION	Very poorly	Poorly	Fairly	Well	Very well	AWARD MARKS
1	**LEADERSHIP** Role & Commitment of Management, Sustainability of 5-S activity, Training Program for Middle Mgt., Setting up 5-S Committees, 5-S Campaigns.						
1.1	Commitment, knowledge, Awareness on 5S among Managers and health workers	1	2	3	4	5	
1.2	5S progress meeting, monitoring evaluation conducted by WIT and recorded in minutes	1	2	3	4	5	
1.3	Evidence of trainings conducted for Managers and health workers	1	2	3	4	5	
	TOTAL	**Full mark 15**					
	Acquired marks / 15 x 100 =						
2	**SEIRI – (SORTING) "Sasambua"** Clutter free Environment in Premises, Inside Offices, Work Place, etc. Evidence of removal of unwanted items should be evident all around.						
2.1	Unwanted items removed from Premises, Offices, Work Places including drawers, cabinets and shelves	1	2	3	4	5	
2.2	Walls are free of old posters, calendars, pictures	1	2	3	4	5	
2.3	Notice Boards – Current Notices with removal instructions	1	2	3	4	5	
2.4	Color cording for waste disposal maintained and standards followed	1	2	3	4	5	
	TOTAL	**Full mark 20**					0
	Acquired marks / 20 x 100 =						0
3	**SEITON – (SETTING / ORGANISATION) "Seti"** Ability to find whatever is required with the least possible delay, evidence of eliminating the waste of time throughout the Institute/Organization.						
3.1	Photographic evidence of Pre 5-S Implementation and afterwards	1	2	3	4	5	
3.2	Visual Control methods adopted to prevent mix-up of items (files, equipment, tools etc.)	1	2	3	4	5	
3.3	Directional Boards from hospital entrance to all facilities under your section/departments (office, wards, Laboratory etc.) and corridors are clearly marked	1	2	3	4	5	
3.4	All machines/Rooms/Toilets/Switches/fans regulators etc. have identification labels	1	2	3	4	5	
3.5	All items are arranged according to 'Can See', 'Can Take Out' & 'Can Return' principle	1	2	3	4	5	
3.6	X-axis, Y-axis alignment is evident everywhere	1	2	3	4	5	
	TOTAL	**Full mark 30**					0
	Acquired marks / 30 x 100 =						0
4	**SEISO – (SHINING / CLEANLINESS) "Safisha"** The Cleanliness all round the Institution should have been carried out according to the 5-S Concepts.						

4.1	Floors, Walls, Windows, Toilets, Change Rooms in working order & clean	1	2	3	4	5	
4.2	Cleaning responsibility Maps and Schedules displayed	1	2	3	4	5	
4.3	Waste bin strategy is implemented	1	2	3	4	5	
4.4	Use of adequate cleaning tools is evident	1	2	3	4	5	
4.5	Storage of cleaning tools – Brooms/Maps/Other equipment	1	2	3	4	5	
4.6	Machines/Equipment/Tools/Furniture at a high level of Cleanliness & maintenance schedules displayed	1	2	3	4	5	
	TOTAL	**Full mark 30**					**0**
		Acquired marks / 30 x 100 =					**0**
5	**SEIKETSU – (STANDARDIZATION) " Sanifisha"** High level of Standardization in all activities carried out in SEIRI, SEITON and SEISO and the evidence of such standards being practiced all around.						
5.1	Adopt 5-S procedures & standardized on Check list, Labels Corridors/Isles & Gangways	1	2	3	4	5	
5.2	Standardization of Maintenance/Storage of Files/Records / Orderliness in Keeping Furniture/Equipment in Offices/Workplaces, etc.	1	2	3	4	5	
5.3	Standardized check lists for common Administrative Procedures in hospital and department	1	2	3	4	5	
	TOTAL	**Full mark 15**					**0**
		Acquired marks / 15 x 100 =					**0**
6	**SHITSUKE – (SUSTAIN / SELF DISCIPLINE) "Shikilia"** Evidence of an disciplined approach to all 5-S activities through proper Training & Development, which shows the sustainability in the long term.						
6.1	Evidence of regular training program for all categories of Employees in the section	1	2	3	4	5	
6.2	Evidence of WIT Activities & promotion of Kaizen Schemes	1	2	3	4	5	
6.3	Evidence in carrying out Internal Audits by WIT	1	2	3	4	5	
6.4	Evidence of Self Discipline among visitors to the Institution	1	2	3	4	5	
6.5	Evidence of Self-Discipline in the overall Institution	1	2	3	4	5	
	TOTAL	**Full mark 25**					**0**
		Acquired marks / 25 x 100 =					**0**
	GRAND TOTAL for 5S activities	**Full mark 135**					
7	**Productivity/Services** Measures how efficiently inputs to Output are used to produce goods & services with better management techniques and work methods.						
7.1	Evidence of methods & systems adopted to improve productivity/employee	1	2	3	4	5	
7.2	Efficiency and effectiveness, use of innovative method to increase and sustain productivity	1	2	3	4	5	
7.3	Evidence in the use of 5S Process to increase Productivity	1	2	3	4	5	
	TOTAL	**Full mark15**					**0**
		Acquired marks / 15 x 100 =					**0**
8	**Quality** Goal is to create satisfied customers by doing 100% right work, responding speedily to requirements every time thus gaining trust & confidence.						
8.1	Communication plans are evident for Implementation of Quality Improvement	1	2	3	4	5	
8.2	Evidence of fewer rejects, less wastage, less rework through 5S Process	1	2	3	4	5	

8.3	The Quality in the Process of the Manufacture/Service by 5S implementation	1	2	3	4	5	
	TOTAL	**Full mark 15**					**0**
	Acquired marks / 15 x 100 =						**0**
9	**Cost** The intrinsic cost of providing products/services to declared standards by a given specified process right first time and every time						
9.1	Evidence in reduction in cost of materials, Labor, Energy, Overheads lowering of defects etc. by introducing 5S concept	1	2	3	4	5	
9.2	Tangible cost advantages through 5S methods in waste control	1	2	3	4	5	
9.3	Evidence of lowering Inventory Cost by the use of 5S Methods	1	2	3	4	5	
	TOTAL	**Full mark 15**					**0**
	Acquired marks / 15 x 100 =						**0**
10	**Safety** The overall safety to Employees, Visitors and Property is evidently displayed by the use of 5S Process						
10.1	Evidence of the effect of safety measured by less accidents occurred in the year	1	2	3	4	5	
10.2	Methods applied in Machinery & Equipment on safety measures	1	2	3	4	5	
10.3	Methods applied to protect the Employees/Visitors on accident	1	2	3	4	5	
10.4	Evidence of Safety Measures applied in providing an excellent health service	1	2	3	4	5	
10.5	Evidence knowledge and skills of employee on safety	1	2	3	4	5	
	TOTAL	**Full mark 25**					**0**
	Acquired marks / 25 x 100 =						**0**
11	**Delivery** Evidence in the reduction of the delivery time of the Product/Service by the implementation of 5S Process						
11.1	Evidence of timely delivery of Products/Services	1	2	3	4	5	
11.2	Overall effect to health facility by reducing delivery time	1	2	3	4	5	
11.3	Evidence of employee participation to reduce the delivery time	1	2	3	4	5	
11.4	Evidence of Just In Time in the hospital	1	2	3	4	5	
	TOTAL	**Full mark 20**					**0**
	Acquired marks / 20 x 100 =						**0**
12	**Morale** Evidence in the overall Institution/Organization in improving the Morale by the implementation of 5S Process						
12.1	Level of morale displayed by Managers & Workers	1	2	3	4	5	
12.2	Evidence of projects carried out by the employees to display high level of Morale	1	2	3	4	5	
12.3	Evidence of 5S - KAIZEN mindset or TQM culture	1	2	3	4	5	
	TOTAL	**Full mark 15**					**0**
	Acquired marks / 15 x 100 =						**0**
13	**5S Organization, Work Improvement Team (WIT)** Role &Activities of WIT,						
13.1	Member of WIT are actively working	1	2	3	4	5	
13.2	WIT's activities are carried out according schedule	1	2	3	4	5	

13.3	Evidence of regular WIT and QIT meeting	1	2	3	4	5	
	TOTAL	**Full mark 15**					**0**
		Acquired marks / 15 x 100 =					**0**
14	**Empowerment of hospital staff through 5S, KAIZEN, TQM** Opportunity and environment for empowerment for hospital staff by themselves						
14.1	Evidence of learning opportunity for 5S, KAIZEN, TQM	1	2	3	4	5	
14.2	Seminar and Training on 5S-KAIZEN-TQM are conducted for WIT members	1	2	3	4	5	
	TOTAL	**Full mark 10**					**0**
		Acquired marks / 10 x 100 =					**0**
	GRAND TOTAL for 5S activities	**Full mark 140**					**0**

Annex 3

M&E sheet for the progress of 5S activities points to be observed

	DESCRIPTION	Points to be observed
1	**5S LEADERSHIP OF HOSPITAL / DEPERTMENT MANAGEMENT** Role & Commitment of Management, Sustainability of 5-S activity, Training Program for Middle Mgt., Setting up 5-S Committees, 5-S Campaigns.	
1.1	Commitment, knowledge, Awareness on 5S among Managers and health workers	Observe 5S implementation and attitude of staff, and make some questions to section in-charge and staff for checking their knowledge and commitment on 5S
1.2	5S progress meeting, monitoring and evaluation conducted by WIT and recorded in minutes	Ask section in-charge and staff to show us minutes of meeting and other record on 5S activities. Check the contents of records and judge whether records are kept well and accessible or not.
1.3	Evidence of trainings conducted for Managers and health workers	Ask section in-charge and staff to show us training report/manual/material for internal training
2	**SEIRI – (SORTING) "Sasambua"** Clutter free Environment in Premises, Inside Offices, Work Place, etc. Removal of unwanted items should be evident all around.	
2.1	Unwanted items removed from Premises, Offices, Work Places including drawers, cabinets and shelves	Observe mentioned places and check whether unnecessary items are removed or not.
2.2	Walls are free of old posters, calendars, pictures	Observe walls, doors and notice boards whether old posters, calendars, picture are removed from them.
2.3	Notice Boards – Current Notices with removal instructions	Observe and check the information displayed on the notice board. It is also important to check if period of display and its instruction are given or not.
2.4	Color coding for waste disposal maintained and standards followed	Observe if Color-coding for waste disposal are applied and check if the instruction of colors and usage for each color are given and shared by all the staff.
3	**SEITON – (SETTING / ORGANISATION) "Seti"** Ability to find whatever is required with the least possible delay, evidence of eliminating the waste of time throughout the Institute/Organization.	
3.1	Photographic evidence of Pre 5-S Implementation and afterwards	Observe and check whether the section displays or keeps pictures of before 5S or not. If you ask and answer is "Pictures are kept by QIT", do not mark more than 3 (Fairly implemented)
3.2	Visual Control methods adopted to prevent mix-up of items (files, equipment, tools etc.)	Observe and check whether the section is using "visual control method" or not. Note that labeling and symbol are not a "visual control method" unless they are designed to manage or control certain operations/processed items
3.3	Directional Boards from hospital entrance to all facilities (office, wards, Laboratory etc.) and corridors are clearly marked	Observe and check whether directional boards to the section are displayed or not at corridors and entrance
3.4	All machines/Rooms/Toilets/Switches/fans regulators etc. have identification labels	Observe and check whether <u>all</u> machines/Rooms/Toilets/Switches/fans regulators etc. are labeled or not
3.5	All items are arranged according to 'Can See', 'Can Take Out' & 'Can Return' principle	Observe and check whether items, equipment etc. are arranged properly to minimize time for searching items with proper workflow
3.6	X-axis, Y-axis alignment is evident everywhere	Observe and check the arrangement of tools and equipment on working bench, furniture and papers & posters on notice boards are aligned on X-Y axis.
4	**SEISO – (SHINING / CLEANLINESS) "Safisha"** The Cleanliness all round the Institution should have been carried out according to the 5-S Concepts.	
4.1	Floors, Walls, Windows, Toilets, Change Rooms in working order & clean	Observe general cleanness of the section e.g. floors, walls, windows, toilets, change rooms and check whether they are functioning or not
4.2	Cleaning responsibility Maps and Schedules displayed	Check whether the section has clear cleaning schedule and map or list of areas to be cleaned
4.3	Waste bin strategy is implemented	Observe and check whether the section is utilizing proper waste bins and wastes are segregated or not. Even if waste bins are color coded, <u>if segregation is not done or they use bin liner in different/inconsistent colors, do not mark more than 3 (Fairly implemented)</u>

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4.4	Use of adequate cleaning tools is evident	Observe and check whether the section has mops, brooms and other common cleaning tools. If cleaning is outsourced, ask the company to show their cleaning tools. It is recommend for each section to keep mops and brooms for sudden incidents
4.5	Storage of cleaning tools – Brooms/Maps/Other equipment	Observe and check whether the section is storing cleaning tools in proper manner e.g. hung in designated spot with labels
4.6	Machines/Equipment/Tools/Furniture at a high level of Cleanliness & maintenance schedules displayed	Observe and check whether the section maintains cleanness of machines, equipment and tools, and make them ready for use.

5	**SEIKETSU – (STANDARDIZATION) " Sanifisha"** High level of Standardization in all activities carried out in SEIRI, SEITON and SEISO and the evidence of such standards being practiced all around.	
5.1	Adopt 5-S procedures & standardized on Check list, Labels Corridors/Isles & Gangways	Observe and check 1) whether QIT or the section has standardized 5S tools e.g. size of labeling and signboards, and 2) whether the section has developed checklists to maintain the condition established for S1-S3. If they have standardized/developed, you need to check how those tools/checklists are used as well.
5.2	Standardization of Maintenance/Storage of Files/Records / Orderliness in Keeping Furniture/Equipment in Offices/Workplaces, etc.	Observe and check whether the section has developed SOP (Standard Operating Procedures) for maintenance of machines, storage of files or records, handling and arrangement of equipment, furniture and so on or not. If you do not see SOP close to the machines or equipment, do not mark more than 3 (Fairly implemented)
5.3	Standardized check lists for common Administrative Procedures in hospital and department	Observe and check whether the section developed check lists for file keeping, reporting, shift change, information sharing and other administrative procedures or not. If the checklists have been developed, you also need to check how they are used.

6	**SHITSUKE – (SUSTAIN / SELF DISCIPLINE) "Shikilia"** Evidence of a disciplined approach to all 5-S activities through proper Training & Development, which shows the sustainability in the long term.	
6.1	Evidence of regular training program for all categories of Employees in the section	Check whether the section has orientation or training program for newly assigned staff to the section or not and ask staff to show the records.
6.2	Evidence WIT Activities & promotion of Kaizen Schemes	Check whether the section started to introduce small Kaizen such as Kaizen suggestions (brainstorming for improvement of work) or not. Check minutes of WIT meeting, Kaizen suggestion sheet etc.
6.3	Evidence in carrying out Internal Audits by WIT	Check whether the section has records of M&E activities (self evaluation and checklist for daily 5S implementation) with pictures or not
6.4	Evidence of Self Discipline among visitors to the Institution	Check whether the section has evidences (message, posters, slogans) for increasing awareness of patients/care-takers/visitors on 5S activities such as cleaning rooms and toilets, waste segregation, hand washing etc. or not. It is also necessary to observe behavior of patients/care-takers/visitors if they are following the mentioned instructions or not.
6.5	Evidence of Self-Discipline in the department/section	Check whether the section has records or evidences (message, posters, slogans) for increasing awareness of staff on 5S activities among staff working in the section. It is also necessary to observe how staff is performing.

7	**Productivity/Services** Measures how efficiently inputs to output are used to produce goods & services with better management techniques and work methods.	
7.1	Evidence of methods & systems adopted to improve productivity/employee	Observe and check whether the section has records or evidences of implementing or introducing some method or systems such as "KANBAN", "Time management", "Process checklist" etc. and education/training on productivity improvement for staff
7.2	Efficiency and effectiveness, use of innovative method to increase and sustain productivity	Observe and check whether the section is applying innovative methods for increasing/sustaining productivity (such as "visual control for stock management", "placement of equipment and tools based on staff movement", etc.) or not
7.3	Evidence in the use of 5S Process to increase Productivity	Observe and check whether the section is practicing S1, S2 and S3 for sustaining clean and conducive working environment for productivity

8	**Quality** Goal is to create satisfied customers by doing 100% right work, responding speedily to requirements every time thus gaining trust & confidence.	
8.1	Communication plans are evident for Implementation of Quality Improvement	Observe and check whether the section is identified how to inform progress of planed activities, resource usage, process of quality improvement etc. to stakeholders by using "standard ranges", "News letters" and so on.
8.2	Evidence of fewer rejects, less wastage, less rework through 5S Process	Observe and check whether the section is taking measures or applied system to reduce wastes or rework by using 5S such as " setting by recycling of plastic container", " setting by visual control for easy inventory", "Standardized checklist for administrative work" etc. or not
8.3	The Quality in the Process of the service by 5S implementation	Observe and check whether the section is considering quality of services such as "waiting time reduction", "clean ward facility", "appropriate consolation time" etc. by 5S activities or not.
9	**Cost** The intrinsic cost of providing products/services to declared standards by a given specified process right first time and every time	
9.1	Evidence in reduction in cost of materials, Labor, Energy, Overheads lowering of defects etc. by introducing 5S concept	Check whether the section is "cost conscious" (thinking or waste of time, energy, money with unnecessary movement, order etc.) or not.
9.2	Tangible cost advantages through 5S methods in waste control	Check inventory book, supply order records etc.,, and observe whether the section is getting advantage on cost reductions through 5S approach (especially S1, S2, and S4) or not
9.3	Evidence of lowering Inventory Cost by the use of 5S Methods	Observe and check whether the section's store is well organized and arranged with proper labeling and has inventory list. It is also need to be checked whether the section is conducting inventory of stock regularly or not. If there is not record of inventory, <u>do not mark more than 3 (Fairly implemented)</u>
10	**Safety** The overall safety to Employees, Visitors and Property is evidently displayed by the use of 5S Process	
10.1	Evidence of the effect of safety measured by less accidents occurred in the year	Ask the staff to show you incident reports. If the incident reports is not existing, mark low
10.2	Methods applied in Machinery & Equipment on safety measures	Observe and check whether the section developed SOP for machines and equipment, applied danger marks and symbols around machines and equipment, or not
10.3	Methods applied to protect the Employees/Visitors on accident	Observe and check whether the section has standing protection gears such as gloves, aprons, goggles etc., and applied warning signs and symbols, or not
10.4	Evidence of Safety Measures applied in providing an excellent health service	Observe and check whether the section introduced safety measures for provision of health care, such as prevention of needle poking, earth wire with ECG machine, proper antiseptic procedure, double checking for medication etc., or not.
10.5	Evidence knowledge and skills of employee on safety	Check whether the staffs working in the section have knowledge and skills on safety measures for workers, visitors and patients, such as KYT (Danger Prediction Training) or not. If the staff cannot answer safety measures, even if fire distinguisher, first aid kit etc. are observed, <u>do not mark more than 3 (Fairly implemented)</u>
11	**Delivery** Evidence in the reduction of the delivery time of the Product/Service by the implementation of 5S Process	
11.1	Evidence of timely delivery of Products/Services	Observe and check whether the staffs working in the section are attending patients when they are demanded by patients or not
11.2	Overall effect to health facility by reducing delivery time	Observe and check whether the system or mechanism established by the section for reducing delivery time is applied in other sections and departments or not. If the method is not well recognized by others and QIT, do not mark more than 3 (Fairly implemented)
11.3	Evidence of employee participation to reduce the delivery time	Observe and check whether the section established system or mechanism to reduce the delivery time such as reduction of paper work, modification of process, proper setting and arrangement of necessary tools and equipment etc.
11.4	Evidence of Just In Time (JIT) in the hospital	Observe and check whether the section understood the meaning of JIT and applied in their services such as medication delivery from pharmacy to ward, tool kit delivery from CSSD to OT, other supply from central store to department etc.

12	**Morale**	
	Evidence in the overall Institution/Organization in improving the Morale by the implementation of 5S Process	
12.1	Level of morale displayed by managers & workers	Observe and check whether section in-charge and WIT members obtained medical ethics thorough asking questions on customer and quality of care. If the staff cannot answer correctly, do not mark more than 3 (Fairly implemented)
12.2	Evidence of projects carried out by the employees to display high level of Morale	Observe and check whether WIT members introduced or established some mechanism (such as "learning customer care", "display monthly slogan for customer care") for improvement morale among staff, or not.
12.3	Evidence of 5S - KAIZEN mindset or TQM culture	Observe and ask staffs on actual purposes of 5S – KAIZEN approaches. If the staff cannot answer correctly, do not mark more than 3 (Fairly implemented)
13	**5S Organization, Work Improvement Team (WIT)**	
	Role &Activities of WIT	
13.1	Member of WIT are actively working	Observe and check whether WIT members are working actively on 5S and kaizen with proper skills and knowledge. Ask WIT members on 5S and roles and responsibility of WIT and if they cannot answer, do not mark more than 3 (Fairly implemented) even the staff seems committed.
13.2	WIT's activities are carried out according schedule	Check WIT action plan or meeting schedules, and minutes of meeting whether the planed schedule and actual activities are matching. If WIT does not have written schedule for meeting, monitoring and other general WIT activities, do not mark more than 3 (Fairly implemented)
13.3	Evidence of regular WIT and QIT meeting	Check Minutes of meeting of WIT-QIT meeting and its period. If the meeting is not held more than 3 month, do not mark more than 3 (Fairly implemented)
14	**Empowerment of hospital staff through 5S, KAIZEN, TQM**	
	Opportunity and environment for empowerment for hospital staff by themselves	
14.1	Evidence of learning opportunity for 5S, KAIZEN, TQM	Check whether staff working in the section are getting learning opportunities such as seminar, workshop and refresher training on 5S-KAIZEN-TQM, or not
14.2	Seminar and Training on 5S-KAIZEN-TQM are conducted for WIT members	Observe and check whether staff working in the section are conducted internal seminar, workshop and refresher training on 5S-KAIZEN-TQM, or not in the past 6 months

Annex 4

KAIZEN Process Checklist

Hospital	
Department/Section/Unit/Ward	
Date of Monitoring	
Member of KAIZEN Team	
QIT facilitator	
Last date of meeting with QIT for consultation	

1. Theme of KAIZEN

2. Situation analysis

Current data table	Pareto chart	Target set
▢ Made correctly	▢ Made correctly	▢ Set
▢ Made but wrongly	▢ Made but wrongly	▢…………………………………………
▢ Not made	▢ Not made	▢ Not set

3. Root cause analysis

Fishbone diagram
▢ Developed correctly and root causes are identified
▢ Developed wrongly and root causes are not well identified
▢ Not done

4. Counter measure identification

Tree diagram	Matrix diagram	Feasibility check
▢ Made correctly	▢ Made correctly	▢ Done correctly
▢ Made but wrongly	▢ Made but wrongly	▢ Done but wrongly
▢ Not made	▢ Not made	▢ Not done

5. Implementation of counter measure

Implementation	Progress check
▢ All identified measures implemented	▢ Checklist developed and used
▢ Identified measures partially implemented	▢ Progress is not check
▢ Not implemented	

6. Effectiveness check

Comparison data table	Comparison Pareto chart	Target achievement
▢ Made correctly	▢ Made correctly	▢ Achieved
▢ Made but wrongly	▢ Made but wrongly	▢…………………………………………
▢ Not made	▢ Not made	▢ Not achieved

7. Standardization of effective measures

8. Suggestion

Annex 5

Progress Report Format

5S-KAIZEN-TQM Progress Report Format

Date of entry: …….. /…… / …..…   Entered by………………………………
………………………………………………..Hospital

1. 5S-CQI (KAIZEN) Training activities conducted in the past 6 months
Fill training activities related with 5S-CQI (KAIZEN)-TQM with the information of whom you targeted and how many staff participated

Sq	*Name of the training*	Target group	Implementation date	# of participants
1				
2				
3				

2. Activities of Quality Improvement Team
Here, report what kind of 5S activities are conducted by QIT for improvement of overall hospital environment such as establishment of 5S corner, hospital map display, sign board display and so on. Moreover, report what QIT did for supporting departmental 5S activities

Activities	*Area(s)*	*Timeframe*	*Changes*

3. 5S Implementation Progress

According to your action plan, reports, which phase are you now. In the row of "Target area" fill all departments you are targeting to implement 5S. If the targeted department formed Work Improvement Team (WIT), check box of "WIT formed". Then use **"5S activities Monitoring Sheet"** to mark the progress of activities to complete this section. For example, if total "leadership" score is 35 out of 75, it will be 35÷75×100 = 46.66 = 47%

Phase	□*Preparatory,* □*Introductory,* □*Implementation,* □*Maintenance*	
Target area(s)	*Establishment of WIT*	*Self-evaluation Results*
	□ Yes □ No	Leadership(%), Sort (%), Set (%), Shine (%)Standardize (%), Sustain (%)
	□ Yes □ No	Leadership(%), Sort (%), Set (%), Shine (%)Standardize (%), Sustain (%)
	□ Yes □ No	Leadership(%), Sort (%), Set (%), Shine (%)Standardize (%), Sustain (%)
	□ Yes □ No	Leadership(%), Sort (%), Set (%), Shine (%)Standardize (%), Sustain (%)
	□ Yes □ No	Leadership(%), Sort (%), Set (%), Shine (%)Standardize (%), Sustain (%)
	□ Yes □ No	Leadership(%), Sort (%), Set (%), Shine (%)Standardize (%), Sustain (%)
	□ Yes □ No	Leadership(%), Sort (%), Set (%), Shine (%)Standardize (%), Sustain (%)

4. Challenges

In the row of "challenges", fill the issues that QIT and HMT need to work on for implementation of QI activities. In the row of "actions planned to be taken", fill the countermeasures for the challenge, followed by who is responsible of the action and necessary inputs to take the action.

Challenges	Actions planned to be taken	Responsible unit	Necessary input

5. Pictorial records: Paste photos of improvement. Pick good example of5S-CQI (KAIZEN)-TQM activities' photographs

Before	After

Before	After

Before	After

Annex 6-a

Good Practice Sheet

Date			Name of WIT		Team Leader	
Content of Activity					**Team Member**	
Target Process						
Target Product						
Picture of previous condition					**Picture of current condition improved by 5S**	
Description of previous condition					**Description of current condition improved by 5S**	

Annex 6-b

Example of Good Practice Sheet (1)

Inputs / Positive impact of 5S

Good Practice Sheet

Newala District Hospital
Group 2 (Ward 5)

Date	03-08-2011	Name Of WIT	M.CHINGWALU	Team Leader	M.CHINGWALU
Content of Activity	WD5			Team Member	M. JUMA R.MNIWASA S.NGALINSE N.LIMATO H.SELEMANI
Target Process	LABO EQUIPMENT				
Target Product	Kurahisisha kazi Inapunguza muda mrefu wa kazi				

Picture of previous condition	Picture of current condition improved by 5S

Description of previous condition	Description of current condition improved by 5S
1. Vifaa vilikaa ovyo ovyo 2. Vifaa vilichaganyawa 3. Investigation trory tulitengeneza 4. Nurses station 5. Tutatumia muda mwingi wa kufanya kazi	1. Tulisasambua kusafisha tulipanga vizuri 2. Tuliweka labeling 3. Palioneshuwa pamependeza 4. Turliweka vizuri 5. Wagonjwa watafurahi 6. Wagonjwa hawahitaji kusubiri 7. Hatutasahau kama tray likiwa complete

Inputs / Positive impact of 5S	Learning by implementing this idea
1. Tulihitaji vifaa(Gloves,maji,sabuni,besem,karatashi,marker pen,plasters,mkasi) 2. Idadi ya watu ilikwa ni wanane tukifanya 5Svizuri tutawahudumiawagonjwa wengi kwa muda mfupi.	1. Tumejua maana ya 5S 2. Tumejua faida ya 5S 3. 5S huwezi kufanya peke yako lazima kushilikiana na wenzako. 4. Mnaweza kubadilishana mawazo 5. Mwisho tunawashukuru Japan kwa kutufanyia semina ya 5S

Annex 6-c

Example of Good Practice Sheet (2)

Good Practice Registration Sheet				
Date	15/05/2011	**Name Of WIT** Volunteer	**Team Leader**	Hisahiro Ishizima
Content of Activity	Development the investigation trolley		**Team Member**	Noriko Komatu Youichi Toriumi Chiaki Yamanaka Noriyuki Miyamoto
Target Process	S1 to S3 activity			
Target Product	Standardized investigation trolley, Checklist, Labels			

Picture of previous condition	Picture of current condition improved by 5S
Description of previous condition	**Description of current condition improved by 5S**

We cannot get some items whenever we need those immediately. And we couldn't keep cleanliness.
  - Some items were mixed regardless of purpose of this trolley.
  - No cleanliness
	We can get needed items for collecting blood specimen and reduce time of collecting some necessary items. Furthermore, we can keep enough amounts of all items by daily checking.
	  - All items are put according to correct working process and labeling is already done.
	  - Trolley is kept cleanliness.
	  - Checklist is put next to the trolley.

Impact of 5S	**Learning by implementing this idea**
- We can reduce waste time of finding necessaries. - We can reduce waste action of finding necessaries. - Checklist is so useful 5S tool to keep necessaries. - Labeling is useful 5S tool to arrange each correct position. - We are able to work with a good feeling every day.	We didn't believe that 5S can reduce time and waste action before, but we can realize that now. Those are some of 5S benefit. And, if we standardize our work, we can work easily and offer our services immediately.

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Annex 7

Pictorial Records of 5S activities in Tanzania

| Central store in MRH before 5S (2007) | Central store in MRH process of 5S (2007) | Central store in MRH after 5S (2008) |

| Open Registry in MRH before 5S (2007) | Open Registry in MRH process of 5S (2007) | Open Registry in MRH after 5S (2008) |

| Medical record in MRH before 5S (2007) | Medical record in MRH process of 5S (2007) | Medical record in MRH after 5S (2008) |

| A ward store in BMC before 5S | A ward store in BMC after 5S |

| A ward store in MRH before 5S | A ward store in MRH after 5S |

| Pharmacy in Tabora RRH before 5S | Pharmacy in Tabora RRH after 5S |

| Waste dumping point at MRH before 5S | Waste dumping point at MRH after 5S |

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