

Quality Management in Health Care

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PRESENTATION OUTLINE

- Definition of quality
- Definition of quality terms
 - Quality management (QM)
 - Quality Assurance (QA)
 - Quality Control (QC)
 - Quality Improvement (QI)
 - Total Quality Management (TQM)
 - Continuous Quality Improvement
 - 5S
 - PDSA

What is quality?

- Excellent
- Superior
- High Caliber
- Best
- **What else?**

Defining Quality

1. Quality is "the totality of features and characteristics of a product or **service** that bears its ability to **satisfy stated or implied needs**" *(International Organization for Standardization (ISO))*

2. A **subjective** term for which each person has his or her own definition. In technical usage, quality can have two meanings:
 - a. The characteristics of a product or service that bear on its ability to satisfy stated or implied needs.
 - b. A product or service **free of deficiencies.**
(American Society of Quality)

Quality in health care

- Accessible and effective care delivered in compliance with evidence-based standards and meets clients' needs and expectations
- Quality means doing the **right things** the **right way**
 - Doing “**right things**” means applying correct interventions to meet customer needs.
 - Doing “**right way**” means applying correct processes, efficiently and on time (using set standards).

Quality grid

+ What you do (things) -
RIGHT WRONG

+
RIGHT
- How you do it (way)
WRONG

| | |
|-----------------------------------|--|
| RIGHT THINGS RIGHT WAY | WRONG THINGS RIGHT WAY |
| RIGHT THINGS WRONG WAY | WRONG THINGS WRONGS WAY |

Quality grid as applied in lab testing

Right things, right way

- Filled out correct lab form and information
- Conducted lab test as requested and conducted correctly
- Filled out incorrect form, but provided accurate information
- Conducted wrong lab test, but conducted it on schedule

Wrong things, right way

Right things, wrong way

Filled out correct form, but provided inaccurate information
Completed correct lab test but patient left before results were available due to long wait

Wrong things, wrong way

- Filled out incorrect form with inaccurate information.
- Conducted wrong lab test and delayed in getting results back to patient

Quality Dimensions (Adapted from WHO)

| | |
|---|---|
| Safety | The avoidance or reduction to acceptable limits of actual or potential harm from health care management or the environment in which health care is delivered |
| Accessibility | Obtaining health care that is timely, geographically reasonable, and provided in a setting where skills and resources are appropriate to medical need |
| Effectiveness | Care, intervention or action achieves desired outcome |
| Efficiency | Achieving desired results with the most cost-effective use of resources |
| Acceptability /patient- centeredness | Service provides respect and is client orientated; respect for dignity, confidentiality, participation in choices, promptness, quality of amenities, access to social support networks and choice of provider |

Quality is built on

- Standards
- Guidelines
- Client needs and expectations

Standards

- Refers to a statement of “desired”/ “achievable” performance of health care intervention which serves as a **reference point for evaluation**
- Standards are usually set by professional societies (Kenya Pediatric Association, NNAK), health care organizations (WHO, UNICEF, UNFPA, UNAIDS), panels of experts or governments

Examples:

- All paediatric admissions should be offered HIV testing using PITC.
- All new-born admissions aged < 14 days should receive Vitamin K unless it has already been given.
- Routine immunization status should be checked and missed vaccines given before discharge.

Guidelines

- Refers to a **set of standards** according to which certain services should be provided in order to obtain the expected results

Examples:

- Basic Paediatric protocols (*For ages up to 5 years*) , 2016
- Kenya National Guidelines for Quality obstetric and perinatal care, 2010
- KQMH Implementation Guidelines, 2011

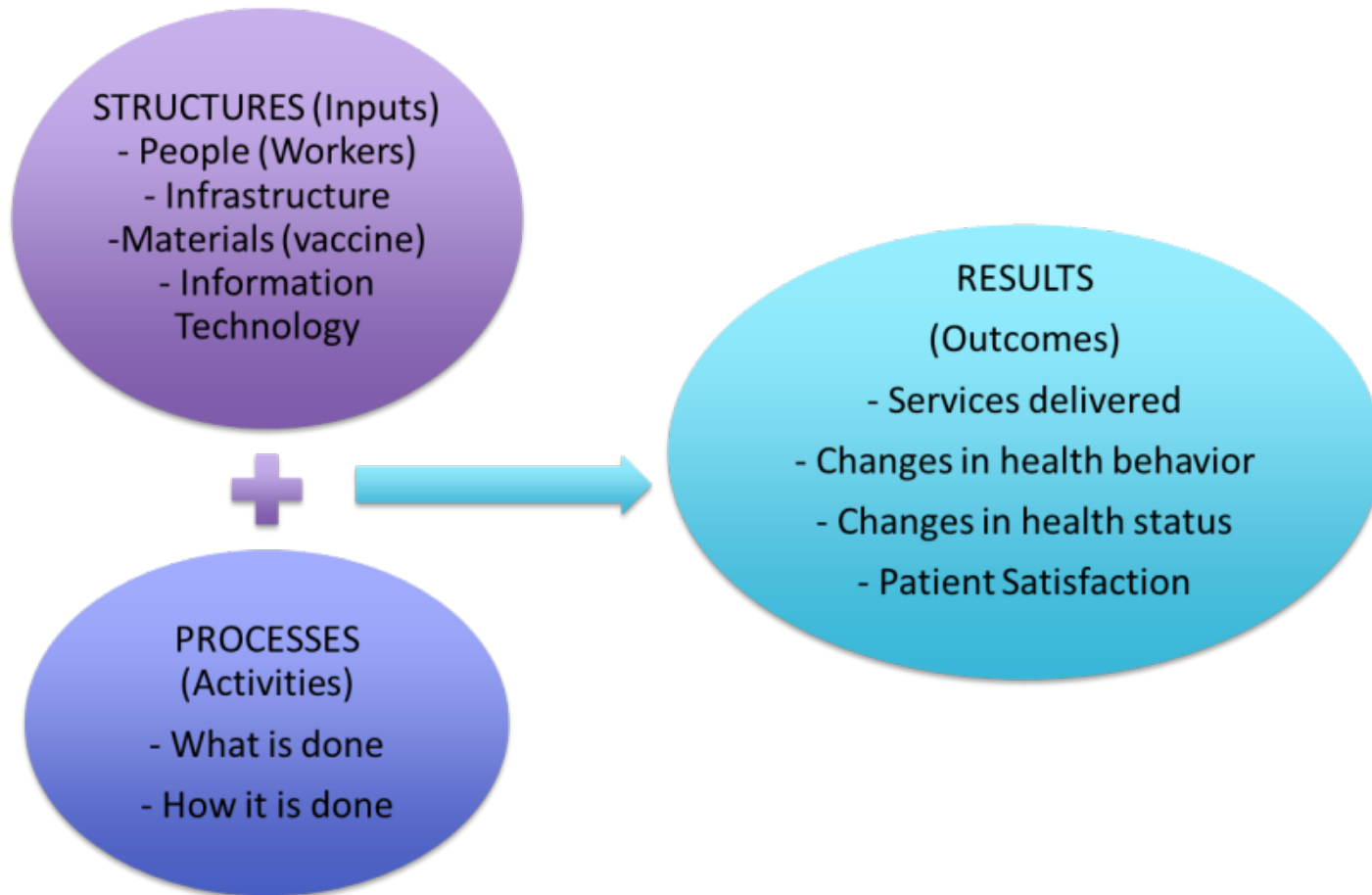
Quality Perspectives

- Also important to see quality through the user's eye
 - Service satisfies the clients needs: timeliness, quantity, place, delivered with right attitude, information
 - Client centered services

We often think of quality through the provider's eye:

- In accordance with defined guidelines
- Care delivered has the desired positive effect on patient health and well-being

Quality based on the Donabedian Model



What are some of the challenges
in provision of *Quality* Health
Care Services?

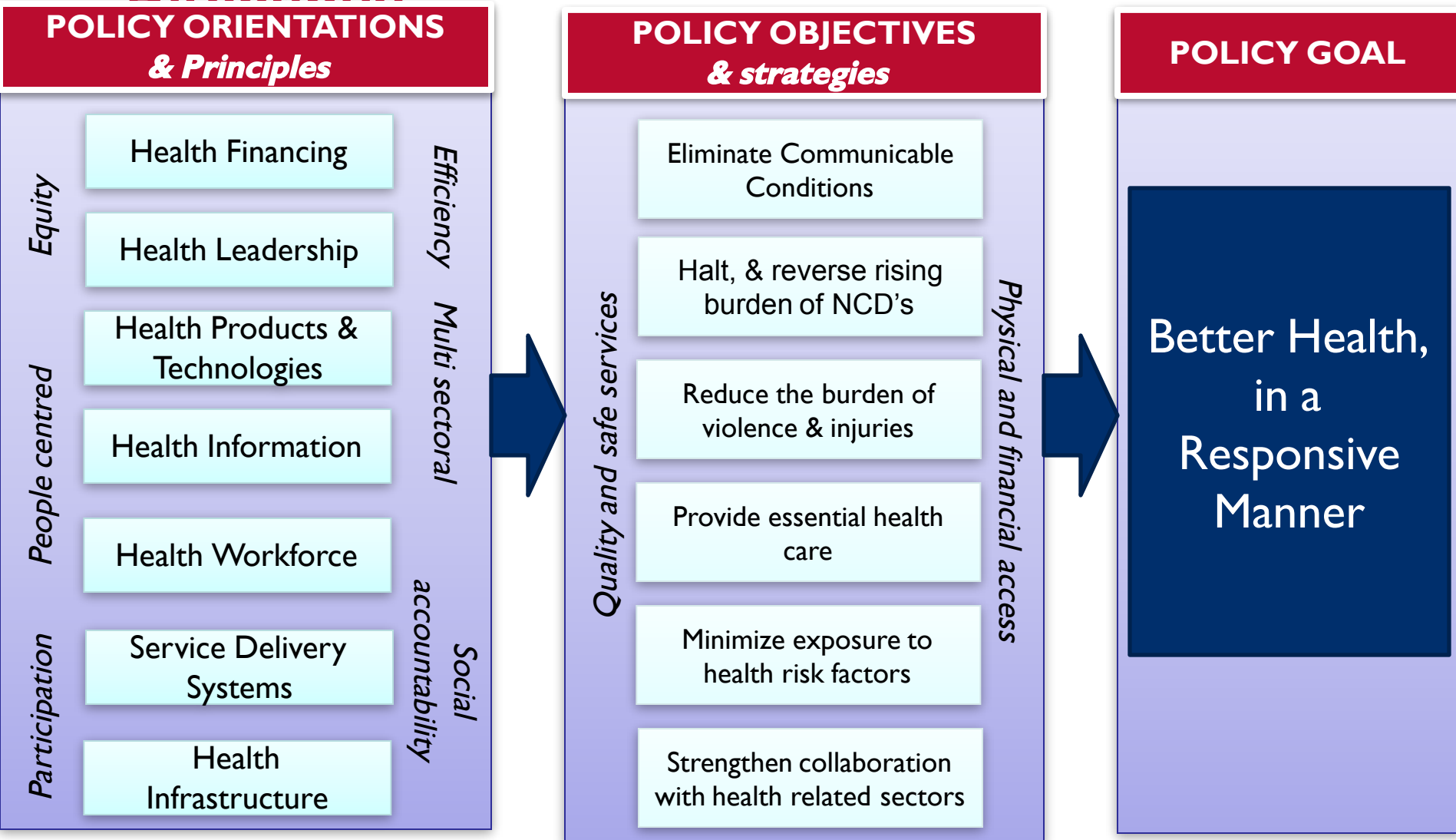
Challenges in provision of *Quality* Health Care Services

- Weak health infrastructure
- Critical shortage of human resources
- Vertical interventions
- Budget constraint/donor dependency
- Training of health care workers

Is there need for emphasis on quality in Health Care?

- **Yes!** It's a constitutional responsibility of government programs to provide quality services
 - Quality Health Care is a right (Constitution of Kenya, Vision 2030, Kenya Health Policy, 2012-2030)
- We need to achieve **desired patient and service delivery outcomes** across all health programs
 - Reduction in morbidity and mortality

Kenya Health Policy 2012 – 2030: Key Directions



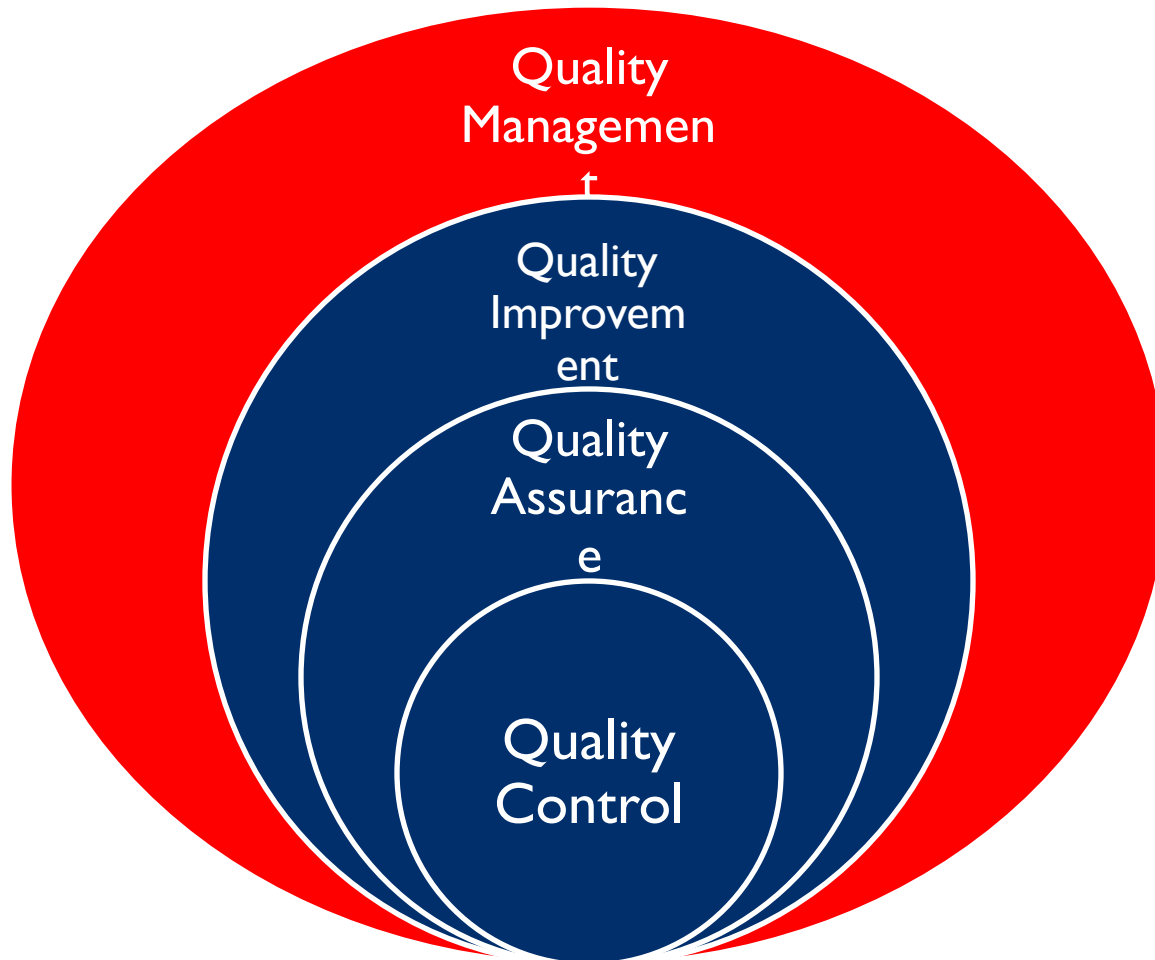
Kenya Situational Analysis

| Indicator | Status | Data Source |
|---|-------------------------------|------------------------------|
| Life expectancy (years) | Males- 61.1, Females- 65.8 | (WHO Health Statistics 2015) |
| Immunization status | 68% | (KDHS 2014) |
| Under 5 mortality Rate | 52 per 1,000 live births | (KDHS 2014) |
| Maternal Mortality Rate | 360 per 100,000 live births | (KDHS 2014) |
| HIV prevalence (adults aged 15-64 years) | 5.6% (1.6 M PLHIV) | (KAIS 2012) |

Kenya Situational Analysis cont'd

| Indicator | Status | Data Source |
|----------------------|--------|--------------------------------|
| Pediatric VL | 68% | (National ACT dashboard, 2017) |
| Adult VL suppression | 86% | (National ACT dashboard, 2017) |
| MTCT rate of | 6.5% | (EID Dashboard, 2017) |
| Contraceptiv | 58% | (KDHS, 2014) |

Quality: Concepts View Point



Definitions: QC, QA, QI, and QM

- QC: Identify problems based on established benchmarks
 - *a product-based reactive, or corrective approach of checking and ensuring that items conform to specific standards*
- QA: Prevent problems based on established benchmarks
 - *a process oriented to guaranteeing that the quality of a product or a service meets some predetermined standard*
- QI: Raising the quality of a product or service beyond current standard
 - *a process of incrementally improving quality of a product or service beyond current standard*
- QM: Coordinating activities and infrastructure within an organization
 - *a management model designed to support the activities that address quality and institutionalize change*

| Quality Control | Quality Assurance | Quality Improvement |
|---|--|---|
| What went wrong? | What went wrong and how do we prevent? | What can we do to improve? |
| Reactive | Proactive | Proactive |
| Seeks to check and ensure products conform to standards | Seeks to fulfill quality requirements of processes per standards -checks processes to ensure that they deliver defect free products/ services | -seeks to make product/ service better than the current status. Avoids blame on individuals but seeks to determine root causes |
| Focuses on corrective responses. | Focuses on the specific incident | Focuses on the entire system and fosters system change |

The Kenya Quality Model for Health, 2011



MINISTRY OF HEALTH



Kenya Quality Model for Health 2009

What is Kenya Quality Model for Health (KQMH) ?

- ▣ **Conceptual framework** for an Integrated Approach to improved quality of health care.
- ▣ Provides a framework for **holistically and systematically addressing** a range of organizational quality issues with the main aim of delivering a positive health impact.
- ▣ The KQMH embraces the 5S, CQI (Continuous Quality Improvement) and Total Quality Management (TQM) improvement model

Three quality Components integrated in the KQMH

1. Evidence Based Medicine (EBM)

Development/revision and dissemination of clinical and public health standards and guidelines that are evidence-based

2. Total Quality Management (TQM)

- Input > Process > Outcome
- Application of QM principles

3. Patient Partnership (PP)

- Patients/Clients are co-producers of health outcome
- Promote community involvement and participation
- Respect patient rights and views

KQMH DIMENSIONS – Donabedian Model

STRUCTURE

1. Leadership-supervision
2. Human Resources
3. Policy; S&G
4. Facility
5. Supplies
6. Equipment
7. Transport
8. Referral
9. Records & HMIS
10. Financial Mgmt.

PROCESS

11. Process:

- Client-Provider-Interaction
- Continuous QI/Keizen
- Programme Mgmt
RH; Malaria, EPI, HIV/
AIDS/TB; IMCI;
Communicable diseases
- Quality Improvement
Teams

OUTCOME

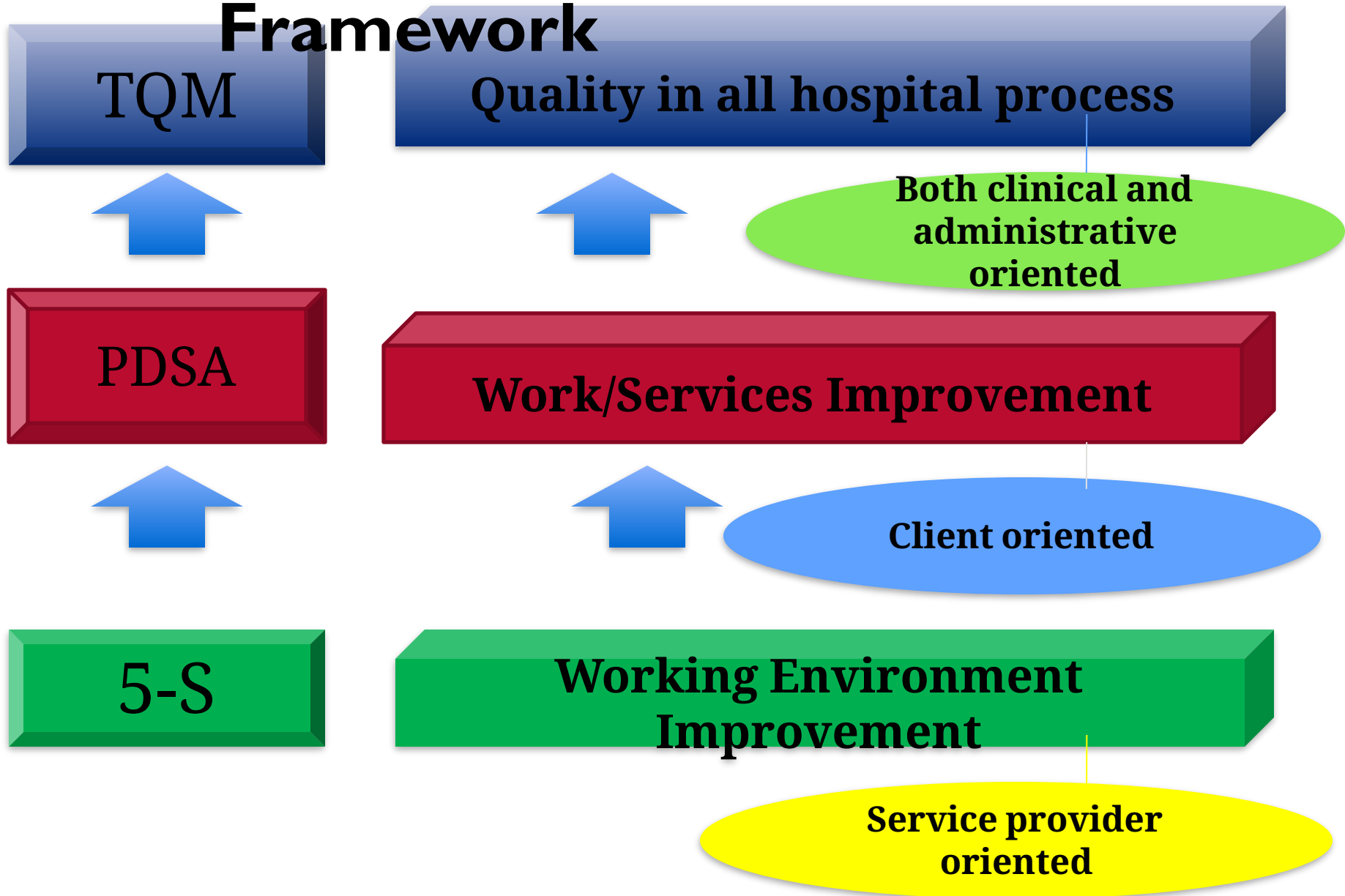
12. Results:

- Users/clients satisfaction
- Performance of facility and
PHC Programmes
- Staff satisfaction
- Society satisfaction

KQMH principles

1. Systems approach to management
2. Process orientation
3. Leadership to provide guidance and motivation to Quality Improvement
4. Customer orientation (external and internal)
5. Involvement of people and stakeholders
6. **Continuous Quality Improvement**
7. Evidence based Decision Making

KQMH Conceptual Framework



Principles of QI

Systems approach to management

Identifying, understanding and managing interrelated steps and processes as a system contributes to the organization's effectiveness and efficiency in achieving set objectives.

Process orientation

This entails addressing all steps required to achieve a desired result and managing activities and related resources as a process.

Leadership

Leaders should strive to create unity in the objective and the directions of the organization while maintaining a team environment in which staff can become fully involved in achieving the organization's objectives.

Customer Orientation and Stakeholder involvement

Current and future Customer requirements and expectations should be understood and met. Full involvement of staff enables the utilization of all abilities for the organization's benefit

Continuous Quality Improvement

CQI focusing on use of the Plan-Do-Study-Act model of quality improvement, promoting incremental change over time that is informed by performance measurement.

Evidence Based Decision Making

Effective decisions based on analysis of data and information should be available, accurate and reliable. Data should also be accessible and decisions should be based on facts balanced with experience and intuition.

Management
Total Quality

Principle 1. Systems approach to management

*...managing a system [for] effectiveness and efficiency**

- Systems are
 - collections of interrelated processes
 - their interfaces, interdependences, etc.
 - that are best managed as a whole (system)
- to achieve
 - efficiency, effectiveness, improvement
 - confidence in capability
 - Team work – each person is important in the healthcare system
- through
 - thorough definition and understanding
 - especially of the KEY processes
 - measurement, evaluation
 - responsibility accountability



Principle 2: Process orientation

*related resources and activities are managed as a process.**

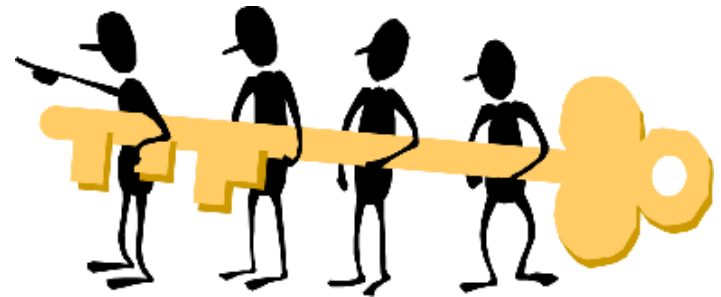
- A process approach
 - achieves desired results more efficiently
 - manages related resources, activities, etc. as a process
- to achieve
 - Greater efficiency and effectiveness
 - reduce cycle times
 - consistency, predictability... improvement
- through
 - defining result... process... inputs...
 - responsibility, accountability, measurement / analysis
 - identifying interfaces, interdependencies
 - focus on critical factors, best opportunities, risks, etc/



Principle 3: Leadership

*unity, purpose, and involvement**

- Leaders establish
 - unity of purpose and direction (QI Teams)
 - environment where people are involved
- to achieve
 - communication, motivation, alignment
 - organization's objectives
- through
 - considering needs of all parties
 - vision, values, goals, targets, etc
 - fairness, respect, ethics, trust
 - providing resources, removing road-blocks
 - inspiring, encouraging, recognizing



Principle 4: Customer Orientation and Stakeholder involvement

*understand, strive to meet and exceed customer expectations.**

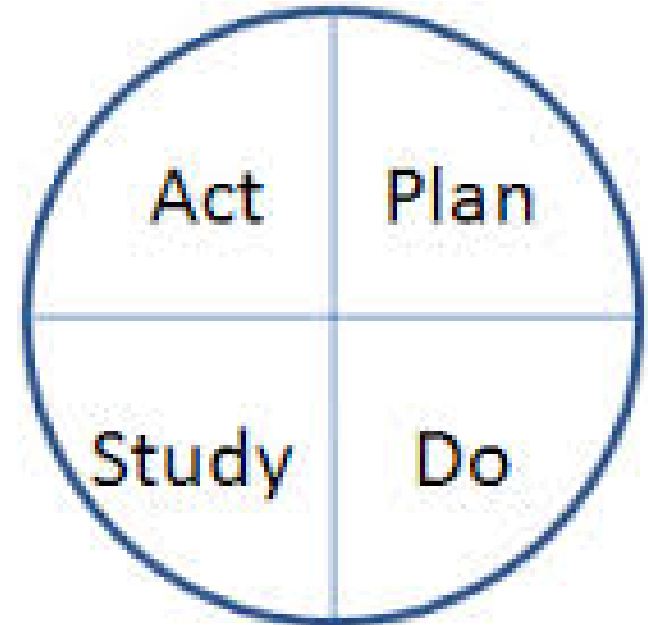
- Health Facilities depend on their customers and should
 - understand needs, current & future
 - meet / exceed those needs
- to achieve
 - performance & effectiveness
 - customer loyalty (adherence etc)
- Through
 - customer understanding
 - alignment of objectives with needs
 - measurement of customer satisfaction
 - balance among needs / interests of all stakeholders



Principle 5: Continuous Quality Improvement

Incremental change towards improvement goals

- Health Facilities should
 - understand performance gaps
 - Select achievable goals
- to achieve
 - Improved services
 - Better client outcomes
- Through
 - PDSA cycles
 - incremental change
 - Maintaining and sustaining positive change



Principle 6: Evidence Based Decision Making

*based on.. analysis of data and information.**

- **“Can’t manage what you can’t measure”**
- **“In God we trust. All others, bring data”**
- Supports the need of improvement teams
- better decisions, results
- verifiable gains, means to hold them
- Measure, collect data
- Analyze it
- Make results available
- Use them



Principles of QI

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Management
Total Quality

What is Quality Improvement?

WHAT IS QUALITY IMPROVEMENT ?

What
IS

The G A
D

What
should BE

Quality

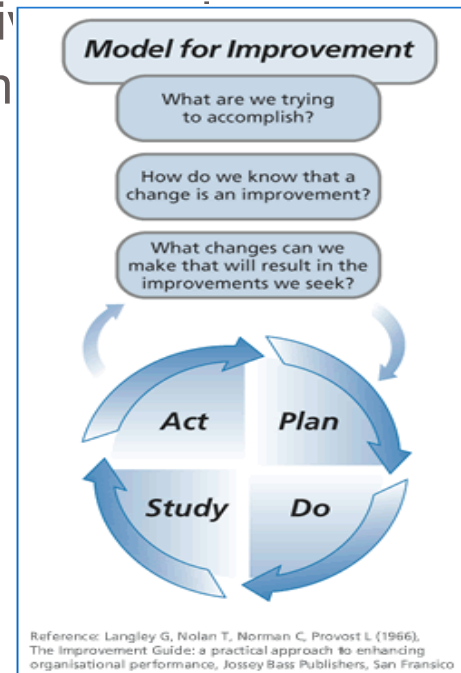
improvement is...

QI is a systematic process of assessing performance of a health system and its services, identify gaps and causes, and introducing measures to improve quality and monitoring the impact

Donabedian through 5-S and PDSA...

- An **enabling environment** for successful implementation of QI is achieved using the **5S** approach
- **Provider capacity** to improve and sustain quality services is built using the **PDSA** approach.
- Both approaches rely on routine service and program data to measure improvements in service delivery and the extent to which client and program

and

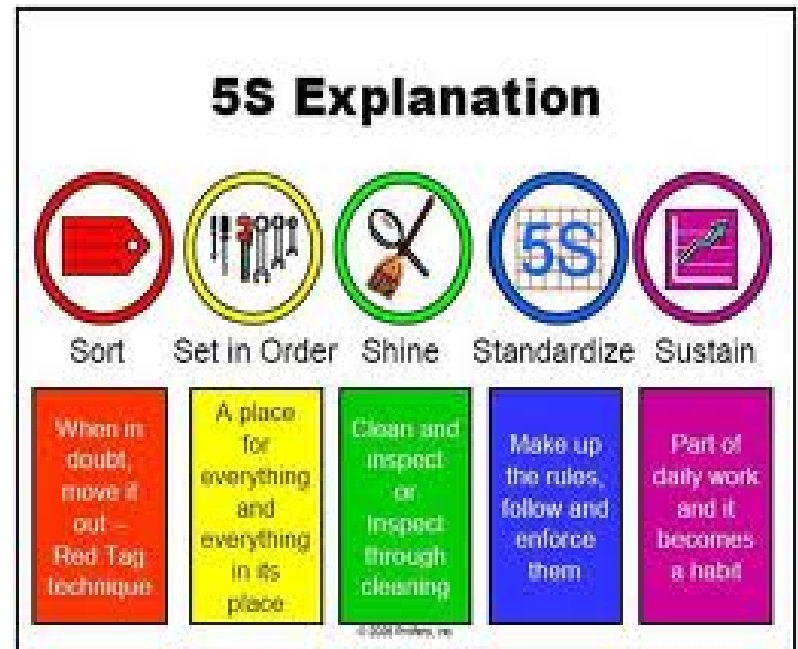


5S is...

- a philosophy
- a way of organizing the workspace and work flow with the intent to **improve efficiency of work**
- **5S** is a management tool, used as a systematic approach for productivity, quality and safety improvement in all types of organizations

Components of 5S

- **5S** is an abbreviation for five terms:
 - Sort (Sasambua)
 - Set (Seti)
 - Shine (Safisha)
 - Standardize (Sanifisha)
 - Sustain (Shikilia)

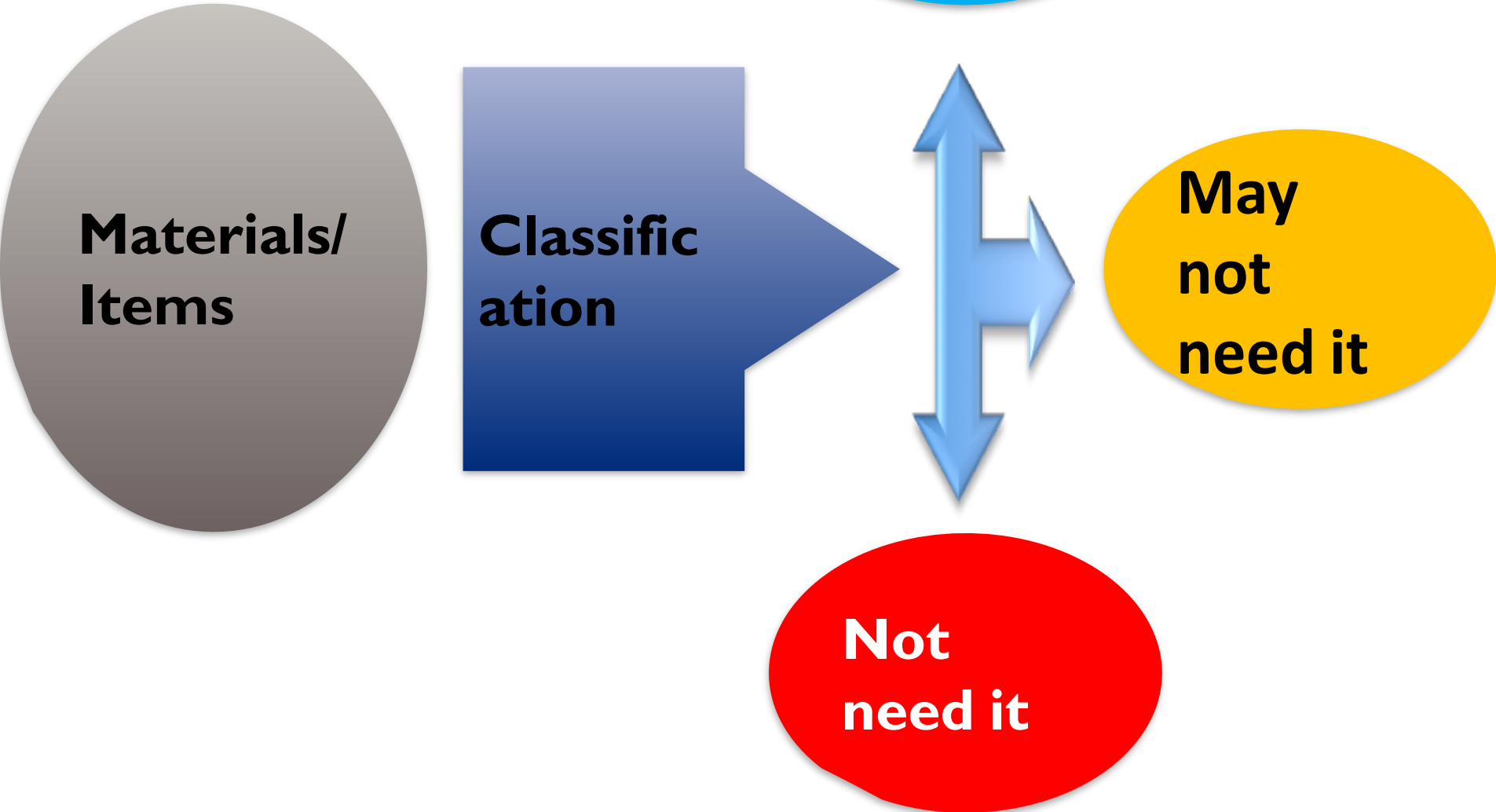


Sort (Sasambua)

- Clear/discard unwanted items in offices, workplace, home
 - Irrelevant items
 - Unwanted structures
 - Unwanted items on shelves, tables, drawers
 - Store (keep) “may be needed” items
 - Regular sorting of unused items
 - Develop culture of returning items to where they belong



Sort (Sasambua)



RED TAGS – USED IN SORT (S1)

5S RED TAG

Dept./Unit.....

Tagged date.....By.....

Date of Re-check.....By.....

- Necessary May be necessary
- Unnecessary

Where to keep.....

Sorting in a ward

Not need it



Not need it



Set (Seti)

Orderliness, systematize to organize all items in easy services provision

- Organize left-over items
- Organize layout of drugs, tools and equipment in order for convenience of operation
- Designated locations.
- Availability at point of use.
- Directional boards to all facilities and Services
- Identification labels for rooms, toilets etc.



Set in Order

A place
for
everything
and
everything
in its
place

Set (Seti) Alignmen t



Labeling
For easy access
to stored items

Shine (Safisha)

Cleanliness and beautifying

- Daily self cleaning
- No dust on floors, tables, shelves, walls and machines
- Adequate cleaning tools/detergents
- Provision of waste bins
- Equipment, buildings, compound maintenance



Shine

Clean and
inspect
or
Inspect
through
cleaning

Shine (Safisha)

Cleanliness and
beautifying

Provision of
waste bins



Standardize (Sanifisha)

Evidence of **Sort, Set and Shine** all around

- Standard Operating Procedures (SOPs)
- Orderliness in the use of corridors
- Storage of files, records and work venues
- Transparency e.g. glass covers on cupboards
- Danger warning signs
- Fire extinguisher signs
- Exit signs
- Electrical switch labels



Standardize

Make up
the rules,
follow and
enforce
them

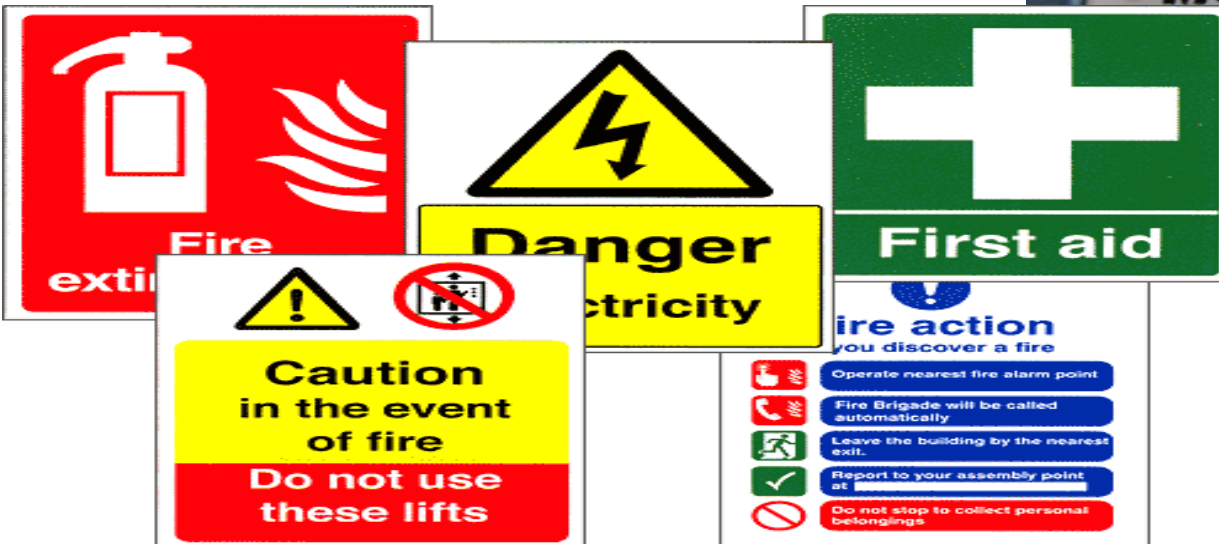
Standardize (Sanifisha)

Direction Signs

To show location of places and facilities in hospitals

Safety Signs

Attention to hazardous items
Guides visitors and workers



Sustain (Shikilia)

- ❑ Self discipline
- ❑ Train staff to follow good work habits
- ❑ Strict observation of workplace rules
- ❑ Regular training programmes for all categories
- ❑ 5S Group activities
- ❑ Self discipline among visitors to the institution
- ❑ Language used in the hospital
- ❑ Professional ethics – dignity, confidentiality.
- ❑ Use of **PDSA** Cycle



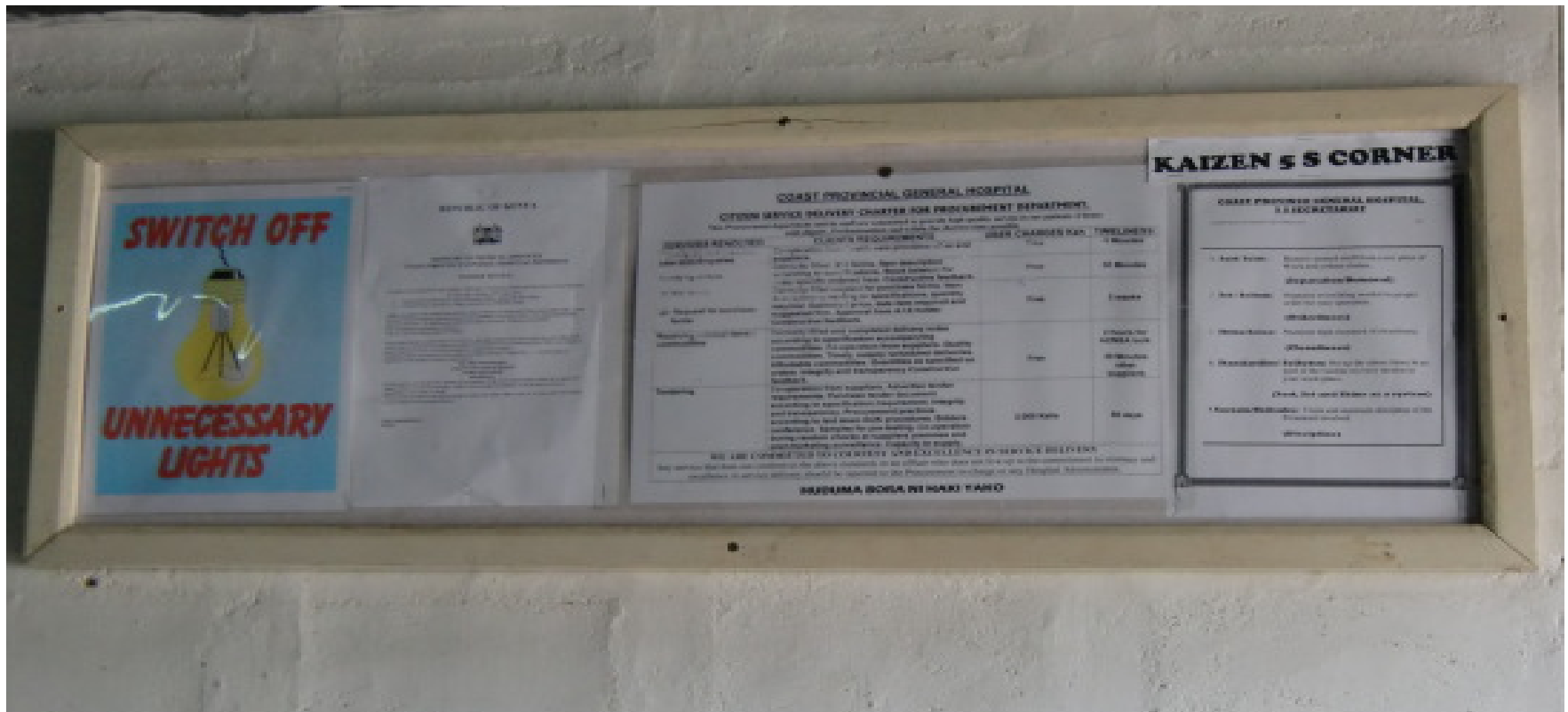
Sustain

Part of
daily work
and it
becomes
a habit

Sustain (Shikilia)

5-S Corner

May use existing notice boards
Establish new notice boards



Importance of 5S

- The workplace gets cleaned and better organized
- Hospital and office operations become easier and safer
- Results are visible to everyone; insider and outsiders
- Visible results enhance the generation of more and new ideas
- People will be proud about their clean and organized workplace
- As a result the health facilities good image generates more business
- People spend half their time at work place looking for things!

Examples of 5S activities in Kenya (I)

Medical records room



Before 5S



After 5S

Examples of 5S Activities in Kenya (2)

HIV Counseling and Testing room



After 5S



Before 5S

Medicine Cupboard

• BEFORE 5S



• AFTER 5S



Linen Store

- BEFORE 5S



- AFTER 5S



Bulletin Board

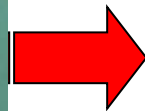
- AFTER 5S



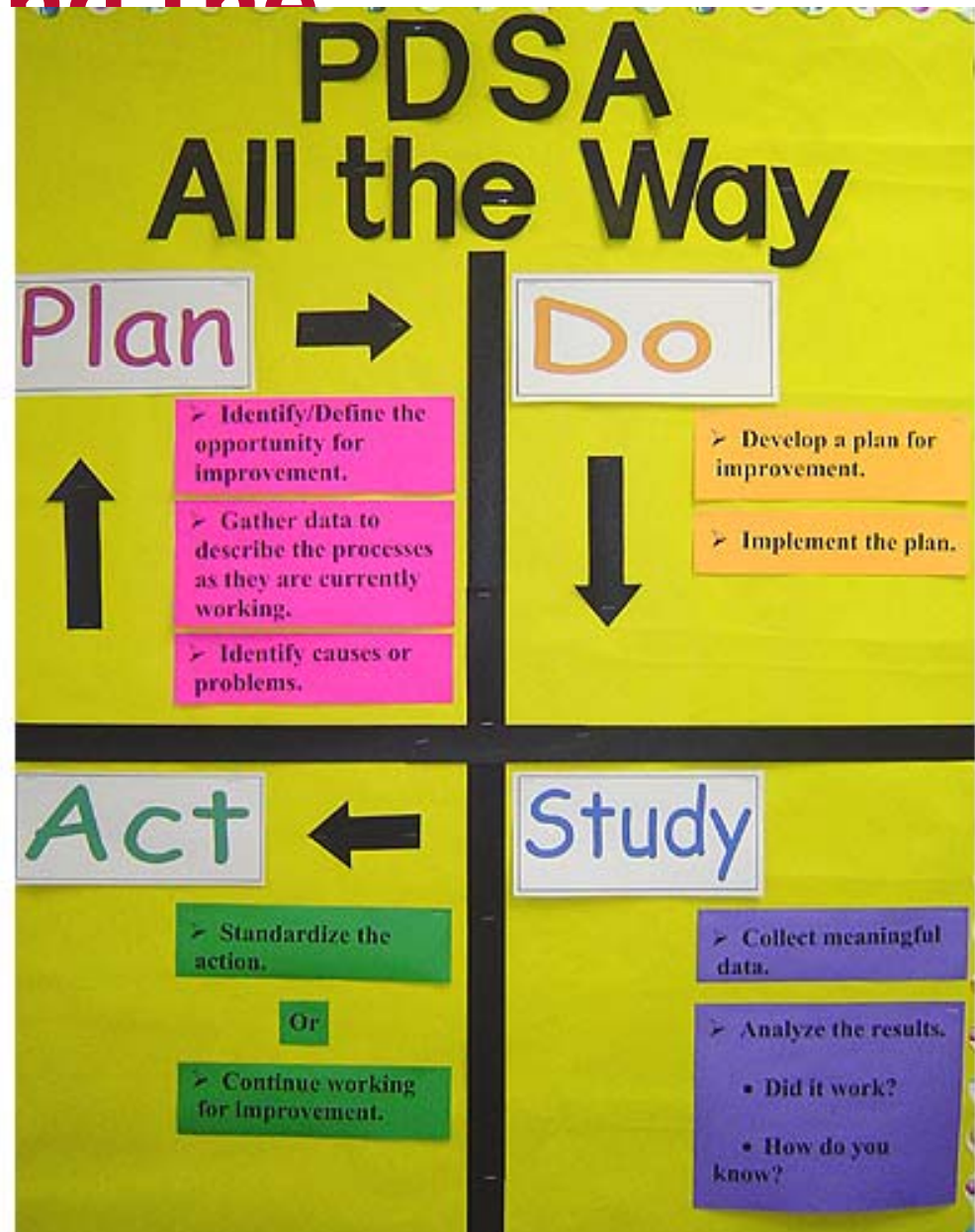
- Orderliness, beautification, poster display (X-Y axis)
- Remove old, out dated posters, calendars, notices regularly from N/Boards.....Tidiness

5. X-Y AXIS – USED IN S2

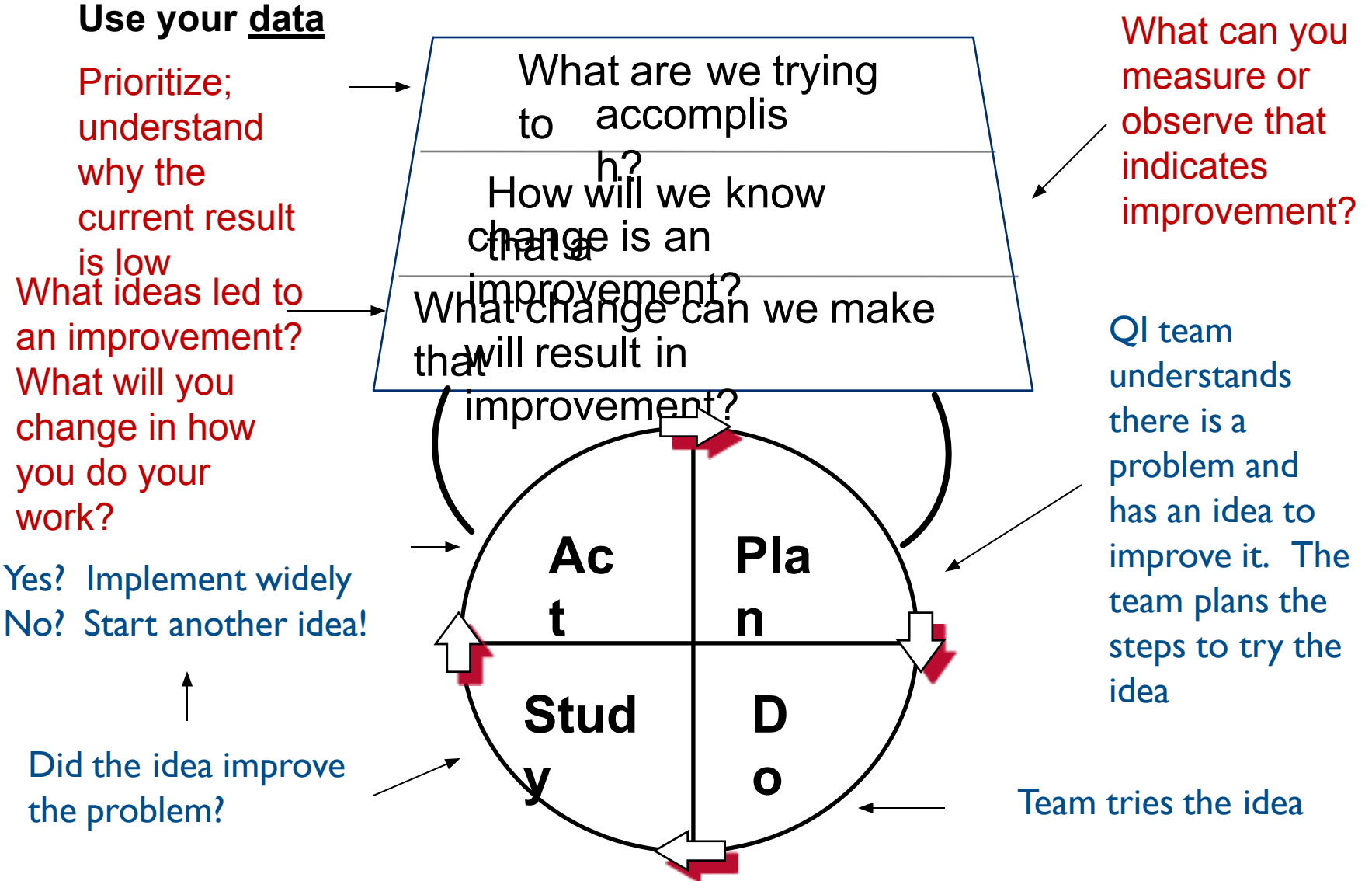
- Orderliness, beautification, poster display
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Steps in QI and the improvement



Model for Improvement



The Model for Improvement was developed by Associates in Process Improvement.

What is Plan, Do, Study, Act cycle?



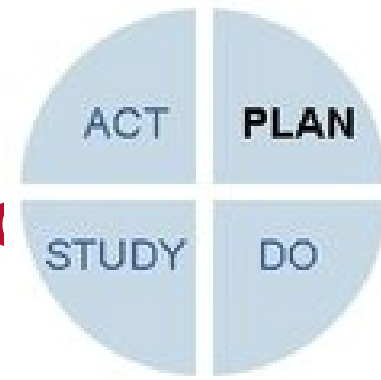
The PDSA cycle is a systematic way of

- identifying problems and analysing
- implementing identified changes,
- measuring the effects of changes and
- decide whether to abandon, modify or implement the change.

PLAN

- a) Problem identification
- b) Goal setting
- c) Root cause analysis
- d) Activity planning and resource allocation
- e) Performance measurement plan





PLAN: a) Problem Identification

- Ways to identify problems
 - Review performance measurement (routine data, QI file reviews)
 - Client satisfaction surveys
 - Organizational assessments
- WIT may brainstorm and then decide on a problem to address using a decision matrix
- Develop a problem statement





A goal is a clear statement of the intended improvement and how it is to be measured

Your goal should:

- Answer the question, “What do you want to accomplish?”
- Be measurable
- **Be short** so that everyone can remember it
- *Doesnot* include *how* you will achieve goal
- May include a beginning and end date





PLAN: c) Root Cause Analysis

Gain deeper understanding of the opportunity for improvement before considering changes

data

- Drawing flow charts or diagrams, 5-whys, fishbc



PLAN: d) Activity planning/ Change package development



- When enough data has been collected to develop hypotheses about what changes or interventions might improve the existing problem
- Use information gathered from previous steps (identify and analyze) to explore and decide which changes would result in QI
- Remember to allocate resources/ responsibilities as needed

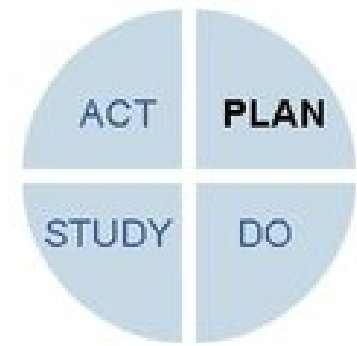


Examples of Change Ideas

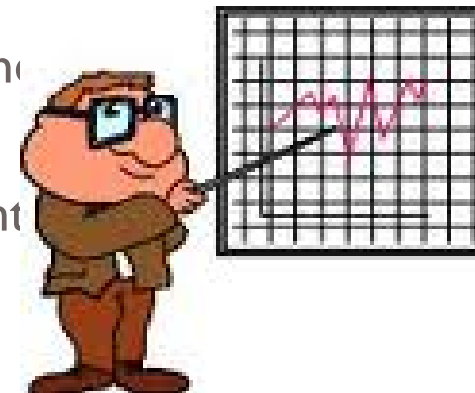
| <i>Root cause</i> | <i>Change Ideas (Interventions)</i> |
|---|---|
| Under diagnosis of TB among HIV+ patients | Study strategies to increase TB screening/diagnosis (training/mentorship, standardized care algorithms, screen at VCT) |
| Low rates of HIV treatment among pregnant women | Study strategies to improve retention into care (decentralize HIV services, improve counseling, involvement of peer counselors) |
| Poor provider adherence to HIV care protocols | Study strategies to improve adherence to protocols (training/mentorship, performance reviews, involvement of lower-level HCWs) |

PLAN:

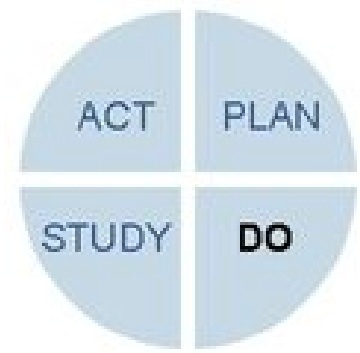
e) Performance measurement



- **Not every change leads to an improvement**
- Proposed solutions need to be tested before institutionalization to see if they lead to expected improvement
- Therefore, a performance measurement plan needs to be put in place...
 - How will we know that the change led to improvement?
 - How should we measure the effect of the change?
 - How will we collect the required data and document it?



DO:
Implement the change



- Implement the change package
- Collect data regularly according to the performance measurement plan.





STUDY

Learn from the data collected during the 'Do' stage.
 .../predictions?

- Is there an improvement? If yes, by how much?
- Are there trends?
- Are there any unintended side effects?
- Is the process more difficult using new methods?
- Is the change scalable?
- Note: Studying should go on continuously throughout the improvement cycle.





ACT

Your responses derived from the Study stage define the tasks for the Act stage.

adopted –

follow the steps outlined under the maintenance phase
institutionalize and sustain the change

OR

The process has not improved – you should
the change to determine reasons for poor
refine the process, and plan another test c

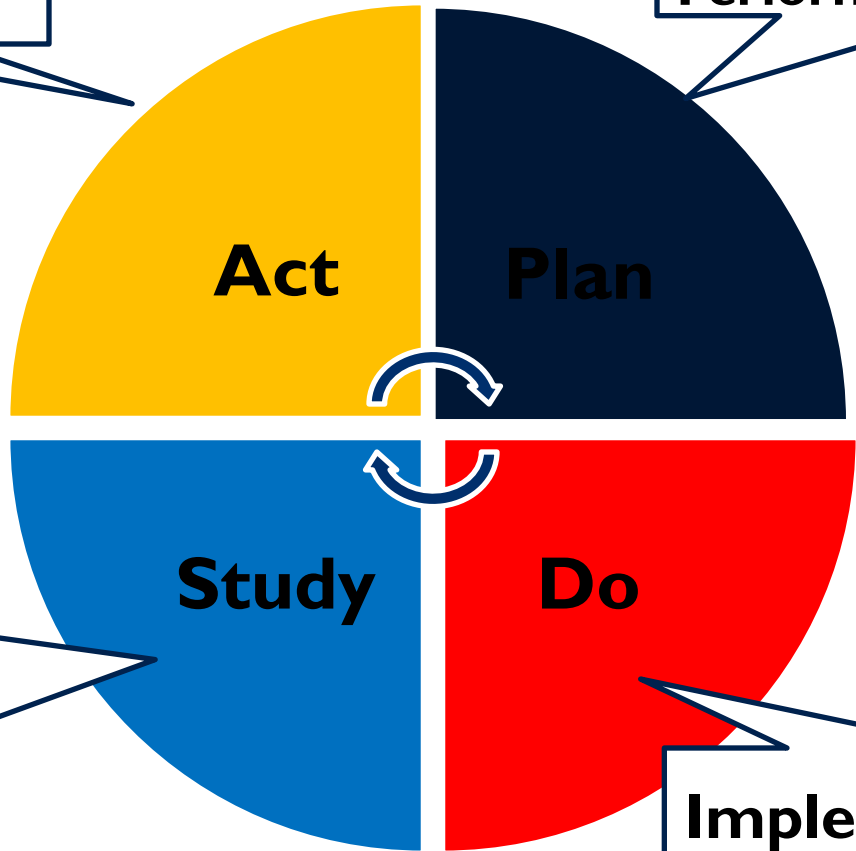


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What did we learn?
What can we predict?

Problem Identification
Goal Setting
Root Cause Analysis
Activity Planning
Performance Measurement

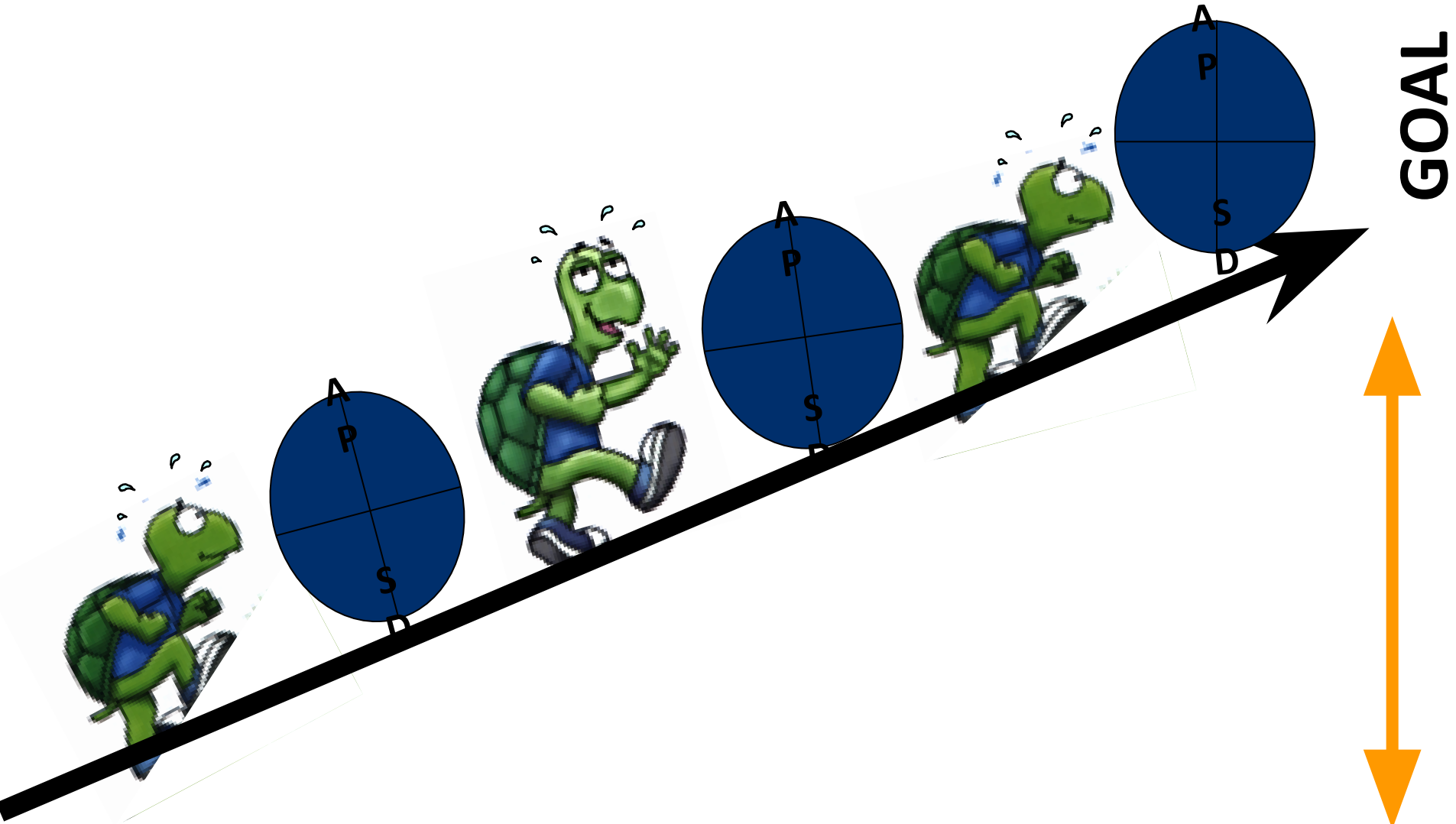


Observe the effects of the change:
Use data, data, and data

Implement the change
Collect data

KAIZEN (CQI)

INCREMENTAL BUT CONTINUOUS PROGRESS



PDSA Simulation & Quality Improvement Tools



Table 6: An example of a decision matrix template

| Potential performance gaps to be addressed | CRITERIA: Rank 1-5 where 5=totally meets criteria | | | | |
|--|---|----------------------------|-------------------------------|----------------------------------|-------|
| | Issue seen as important* | Realistic scope (Control)* | Likelihood of success via QI* | Potential Impact of QI project * | TOTAL |
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |

* Issue seen as important refers to a gap that is crucial or gap that does not meet standards set in National guidelines

* Realistic scope (control) refers to gaps that the facility are able to address at a facility level, that do not involve the macrosystem

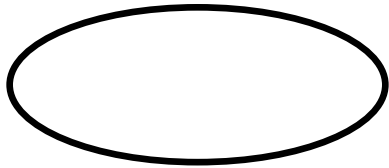
* Likelihood of success refers to performance gaps that can be addressed easily, the so called quick wins

- Potential Impact of QI project refers to performance gaps that if addressed will have the greatest effect
- Review the rankings and select the project with the highest score

Flow Chart (Process Mapping)

- A diagram that uses graphic symbols to depict the nature and flow of the steps in a process
- A picture or a road map of a process

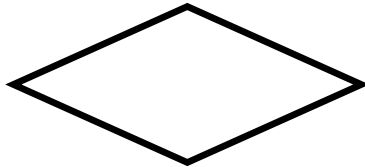
Symbols Used in Flowcharts



Oval: Shows beginning and ending in a process



Rectangle: Depicts particular step or task



Diamond: Indicates a decision point



Arrow: Shows direction of process flow

Patient arrives at front desk

Example of a Process Map

Nurse asks for patient's name and searches the database for his/her file

Patient
in
system?

No

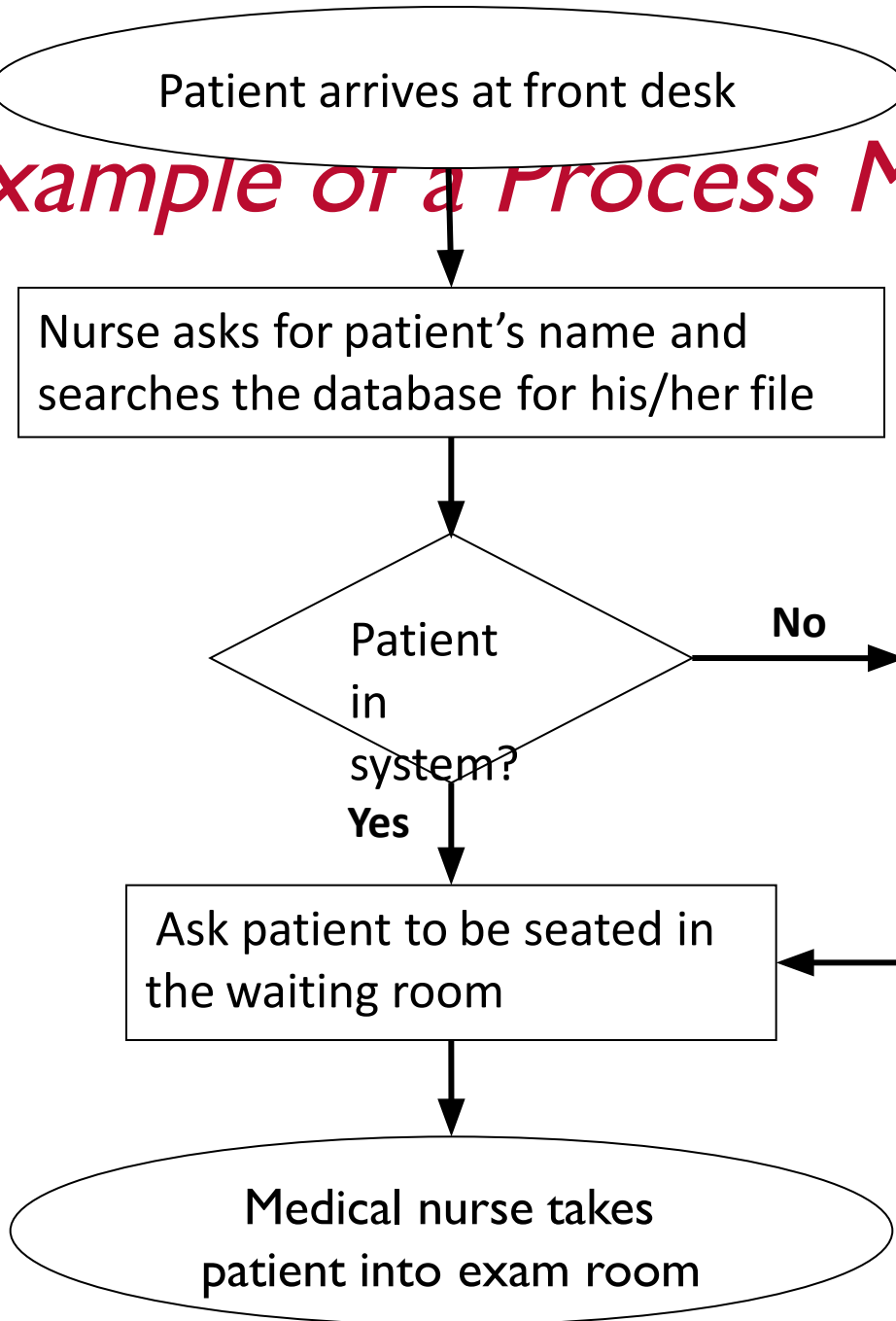
Nurse asks patient to
complete paperwork for new
clients

Yes

Ask patient to be seated in
the waiting room

Patient completes paperwork
and returns to front desk nurse

Medical nurse takes
patient into exam room

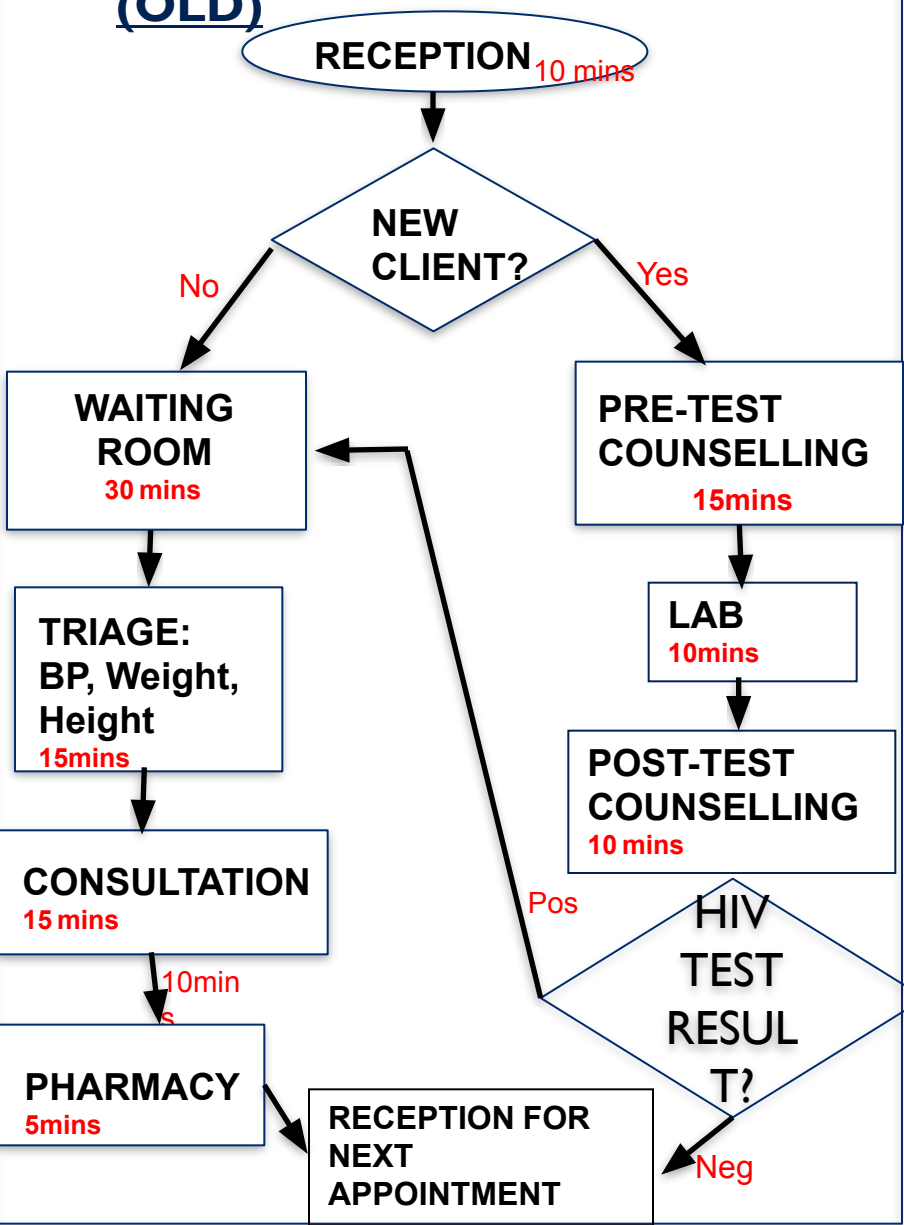


Benefits of Flowcharting

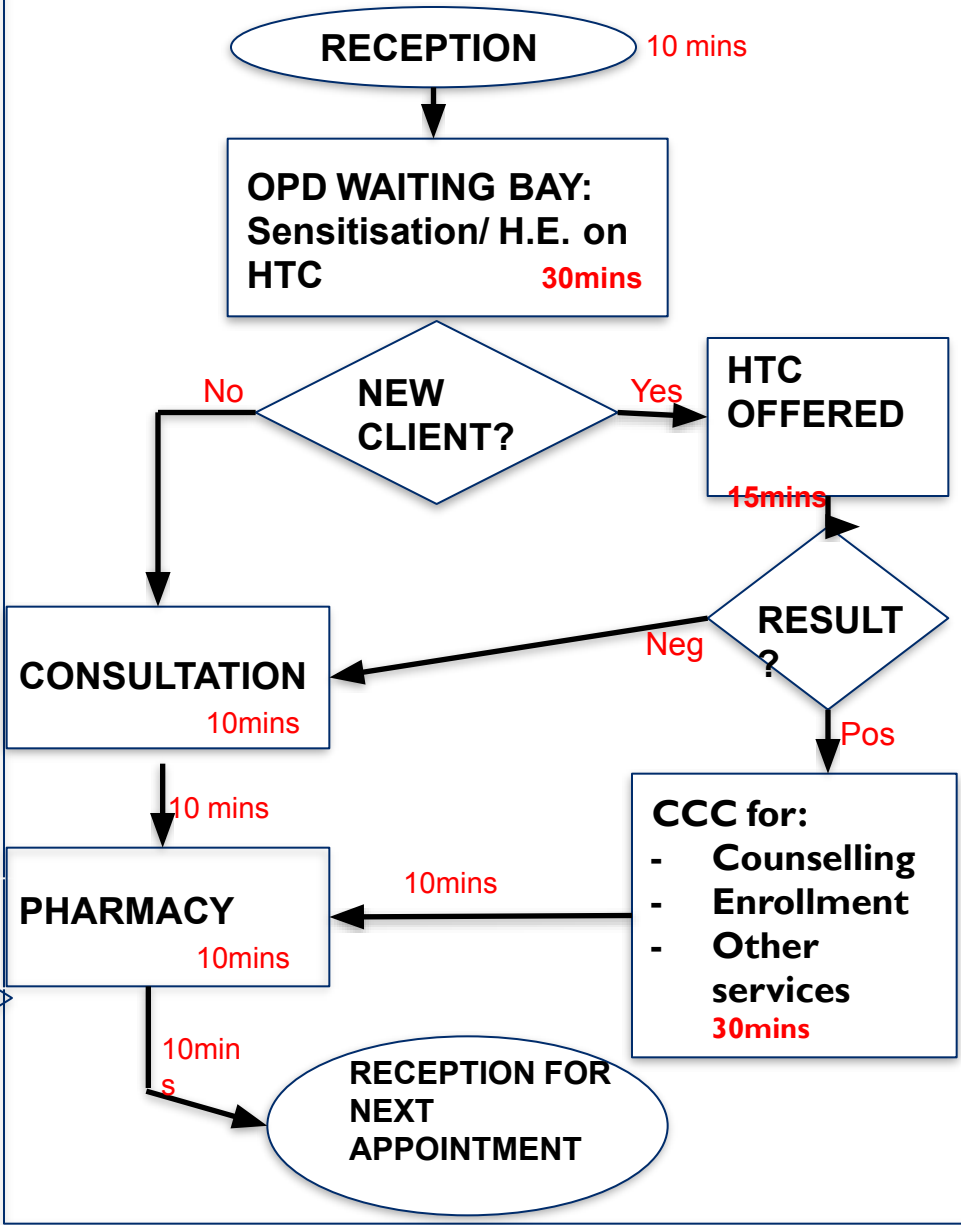
- Visualizes the entire process from beginning to end
- Illustrates the sequence of events
- Highlights any duplications
- Highlights potentially unnecessary tasks
- Establishes the relative complexity of the process



PATIENT FLOW AT PITC (OLD)



PATIENT FLOW AT PITC (NEW)





patient called for appt

check insurance ERM

patient arrives to clinic

Who previews chart before visit?
When is chart previewed?

patient checks in

Does ERM info go into EHR?

Who can see reason for visit
How do we verify reason for visit?

Does patient qualify for free vaccines?

Labels printed

MA calls patient in to room

provider reviews vaccinations

ordering provider needs to verify pt's previous vaccine given

Multi dose vaccines: how is this documented?

Where should the document vaccine (checkbox)?

patient monitored for 15 min after vaccine given

MA opens Master IM

MA triages pt
pt verification reason for visit visit signs

provider sees patient for sick visit

provider orders vaccines

RN receives task and RN prepares vaccines

RN clicks of vis button to generate info sheet

RN gives vaccines

MA gives label to team 2 RN

Team 2 RN opens Peds Immunization record (HIS)

How do you generate vis for non-vising patients?

Five Whys

- The **5 Whys** is a question-asking (br to explore the cause/effect relationships problem.
- Ultimately, the goal of applying the 5 determine a root cause of a gap or p



5 Whys

- There are no wrong answers
- Is not about pointing fingers at individuals
- It is about looking for leaks/defects in the system/processes and work together for an improvement plan
- Narrow your responses to actionable activities. Avoid having responses that involve the macrosystem eg. policy as a final why

Steps: 5 Whys?

1. Write down specific problem.
2. Ask **Why** the problem happens, and write answer down below problem.
3. Ask **Why** again, and write that answer down.
4. Keep asking **Why** until root cause is identified.
5. Keep asking until no new answer is given.
6. This may take 5 Whys or less or more.

5 Why's

Problem: Patients fail to show up for appointments

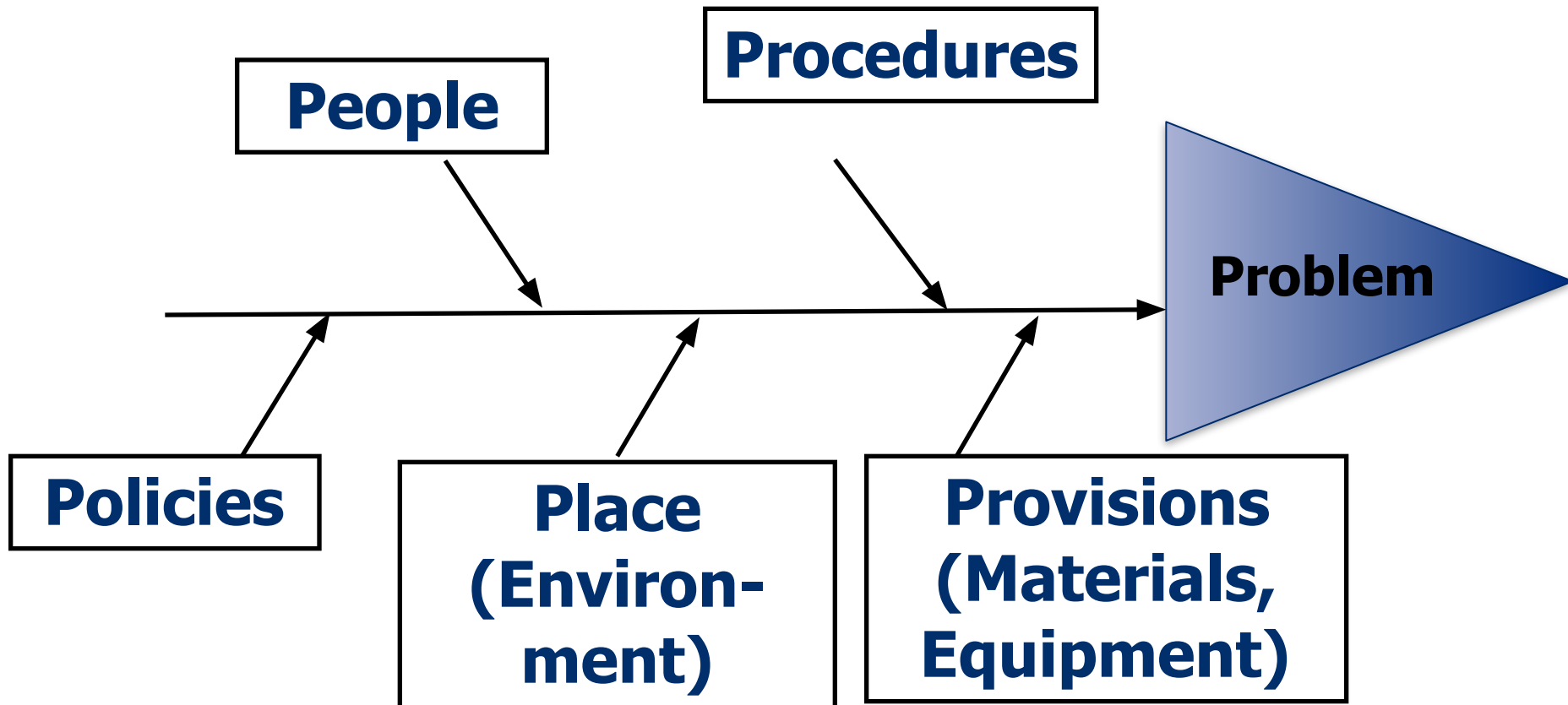
| 5 Why's | Response |
|---|--|
| Why does the patient fail to come? | Patient was not aware of appointment date. |
| Why was the patient not aware of appointment? | Appointment not indicated on the patient's appointment card. |
| Why was appointment date not issued? | Nurse forgot. |
| Why did the nurse forget to give appointment? | Nurse was too busy to record after rendering service. |
| Why was the nurse too busy? | Busy with needs of other patients. |

Intervention: Task shift documentation of appointment in patients' appointment card to CHW/peer educator

Cause and Effect Diagram

(Fishbone)

- A graphic tool that helps identify, sort, and display possible causes of a problem or quality characteristic



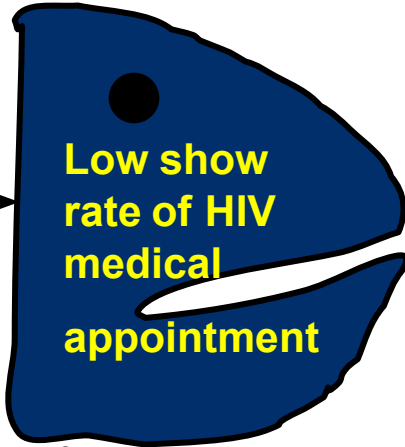
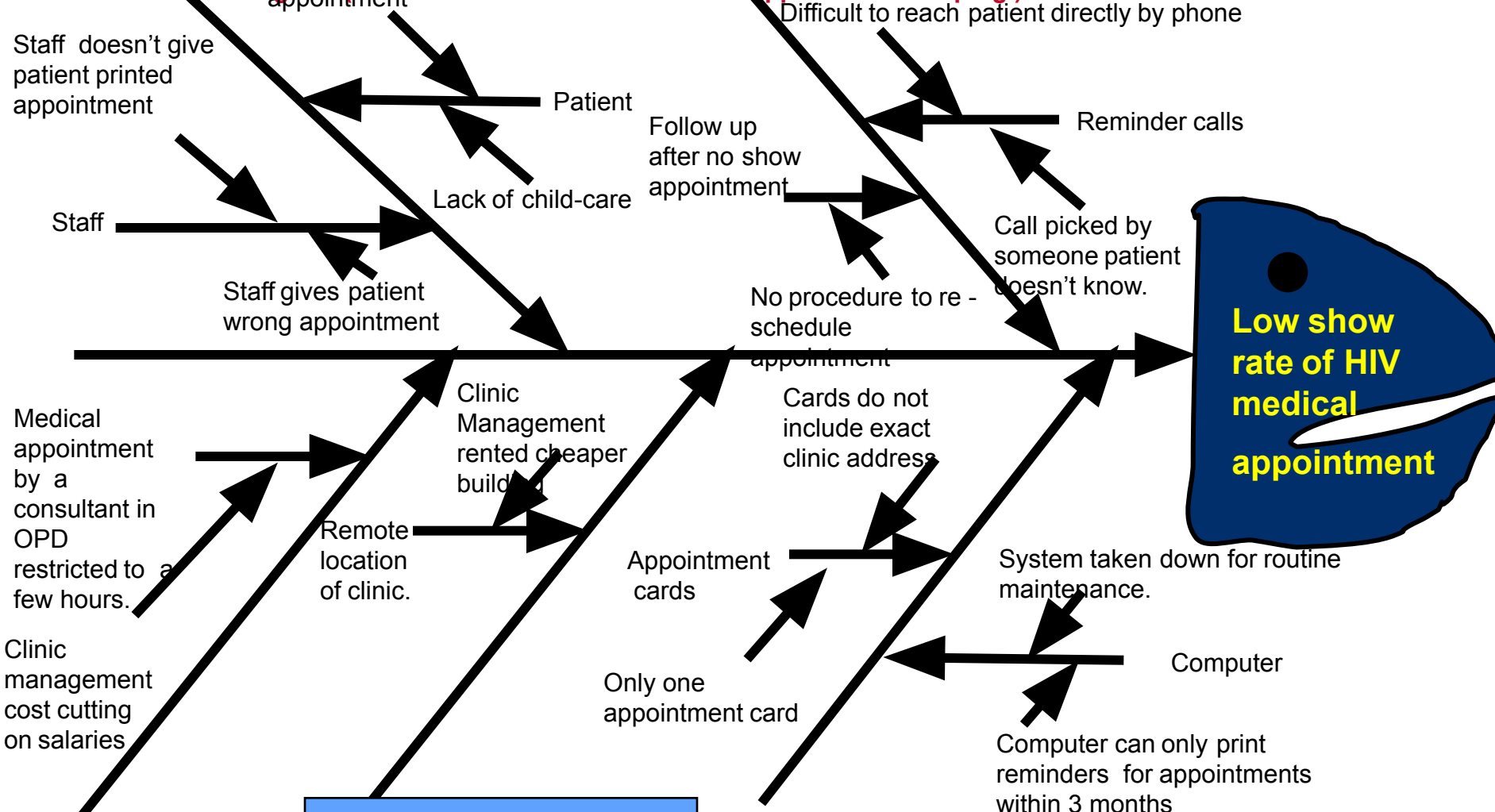
Development procedure of Fishbone Diagram

1. Put Effect = **a major contributing factor** identified in previous step "Head of Fish")
2. Draw heavy line from left to "Effect"("Backbone of fish")
3. Categorize causes in large categories such as **People (Manpower), Provisions (Machine, Equipment), Place (Environment), Procedures and Policy** etc., and branch thick line from "back bone of fish".

People

Procedures

Fishbone Diagram (Multi-factorial causes of medical appointment keeping.)



Policies

Place (Environment)

Provisions (Materials/equipment)

Benefits of Cause & Effect Diagram

- Uses an orderly, easy-to-read format
- Increases knowledge of the process
- Indicates possible causes of variation
- Identifies areas for collecting data

