Performance Improvement Tools

Supplemental Reading

Improvement Tools

- Diagrams, charts, techniques, and methods used during an improvement project (also called *analytic tools*)
  - Quantitative: Used to measure performance, collect and display data, and monitor performance
  - Qualitative: Used to generate ideas, set priorities, maintain direction, determine causes of problems, and clarify processes

During an improvement project, various analytic tools are used to discover the causes of undesirable performance and plan solutions.

Analytic tools are either qualitative or quantitative. Qualitative tools are used to generate ideas, set priorities, maintain direction, determine problem causes, and clarify processes. Quantitative tools are used to measure performance, collect and display data, and monitor performance.

The quantitative tools should look familiar; they were discussed in the prior week lesson of performance assessment. Qualitative tools are used to present ideas in a manageable and useful form. In other words, they give structure to a set of ideas. Qualitative tools are used throughout an improvement project. Together with quantitative tools, qualitative tools help the improvement team define the goal, understand how the process works, identify improvement Brainstorming opportunities, and create solutions.

Quick Reference Guide to Analytic Improvement Tool

	Qualitative Tools	*Quantitative Tools*
Step 1: Define the improvement goal	Affinity diagram Brainstorming Decision matrix Force field analysis Multi-voting Nominal group technique Survey	Bar graph Check sheet Control chart Histogram Line graph Pareto chart Scatter diagram Survey
Step 2: Analyze current practices	Brainstorming Cause and effect diagram Five Whys Flowchart Survey Workflow diagram	Bar graph Check sheet Control chart Histogram Line graph Pareto chart Scatter diagram Survey
Step 3: Design and implement improvements	Affinity diagram Brainstorming Decision matrix Flowchart Force field analysis Nominal group technique Planning matrix Stakeholder analysis Workflow diagram	Bar graph Check sheet Control chart Histogram Line graph Pareto chart Scatter diagram Survey
Step 4: Measure success	Storyboard Survey	Bar graph Check sheet Control chart Histogram Line graph Pareto chart Scatter diagram Survey

Quantitative Tools

- Used in performance assessment *and* performance improvement
  - Bar graph
  - Check sheet
  - Control chart
  - Histogram
  - Line graph
  - Pareto chart
  - Scatter diagram

Qualitative Tools

- Brainstorming
  - Used for creative exploration of options in an environment free of criticism
- Multi-voting
  - Used to pare down a broad list of ideas and establish priorities
- Nominal group technique
  - A structured form of multi-voting

Brainstorming

1)
It is a technique used to quickly generate lots of ideas about a problem or topic. It encourages creative thinking and incites enthusiasm. The most common brainstorming techniques are structured, unstructured, and silent brainstorming. In structured brainstorming, a group leader solicits ideas from group members one at a time. Participants may skip their turn if they don't have an idea. Structured brainstorming is advantageous in that each person has an equal chance to participate, but it is disadvantageous in that it discourages spontaneity and is somewhat restrictive.

2)
Unstructured brainstorming is free-form; participants contribute ideas as they come to mind. Unstructured brainstorming is advantageous in that participants can build on each other's ideas in a relaxed atmosphere. It is disadvantageous in that less assertive or lower-ranking participants (such as non-leadership staff) may not speak up. A few rounds of structured brainstorming followed by unstructured brainstorming may help reticent participants open up.

3)
In silent brainstorming, participants write their ideas on small slips of paper, which are collected and posted for everyone to see. Silent brainstorming is advantageous in that everyone's ideas are captured. In brainstorming sessions where ideas are voiced aloud, ill feelings among team members or fear of disruptive comments may make people reluctant to share their ideas. Silent brainstorming is disadvantageous in that the group does not build the synergy of an open session. Silent brainstorming is often used in combination with other brainstorming techniques.

4)
The result of a brainstorming session is a list of ideas. If this list is too long, the group can narrow it down using another qualitative tool, such as multi-voting or nominal group technique.

Multi-voting

1)
It often follows a brainstorming session. It is used to pare down a broad list of ideas and establish priorities. Multi-voting is a simple and quick method for setting priorities. Which task is most important? What do we need to do first? Which solution will work best? Which improvement goals are most important?

2)
Suppose an improvement team charged with reducing patient wait times in an outpatient clinic has identified several problems that contribute to service delays. They know they can't fix all of these problems at once, so they use multi-voting to determine which problems they should address first. The problems are listed on a flipchart in random order. Team members are given ten self-stick dots (color is irrelevant) and told to place them next to the problems they feel are most urgent. They are instructed to use all ten dots but to place no more than four dots on one problem. When everyone is done, the number of dots next to each problem is tallied. The problems with the highest number of dots are addressed first.

3)
A few clear winners usually stand out. Before finalizing the list of high-priority problems, the team may discuss the results to ensure everyone agrees with the selection.

Nominal group technique

1)
It is a more structured form of multi-voting, involves five steps. The following example illustrates the use of nominal group technique to select solutions for a performance problem. In the first step, the discussion leader states the problem and clarifies it if necessary, to ensure everyone understands. In the second step, each team member silently records potential solutions to the problem and does not discuss them with other team members (as in silent brainstorming). In the third step, each person shares one idea with the group, and the discussion leader records the idea on a flip chart. The process is repeated until all solution ideas have been recorded. As in step two, the ideas are not discussed.

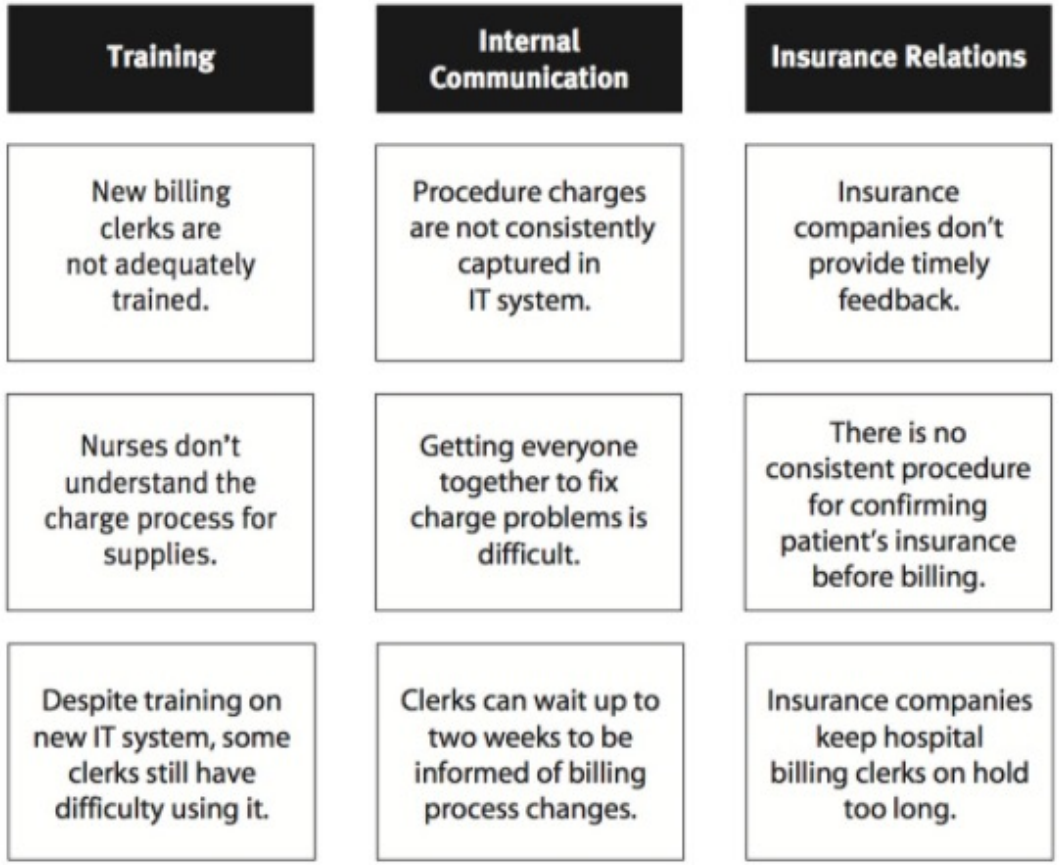
2)
In the fourth step, the team clarifies the ideas listed on the flip chart. The discussion leader may ask some team members to explain their ideas. Comments from other members are not allowed during the explanation. The goal in this step is to ensure everyone understands the suggested solutions. In the final step, the team votes on the ideas silently. Team members are asked to select five ideas they think are most effective, record them on separate index cards, and rank them in order of importance. They mark a “5” on the card for most important, “4” for second most important, and so on.

3)
When team members have finished ranking their ideas, the discussion leader collects the cards and tallies the votes. Items that received one or no votes are removed from the list. Items with the highest total point values are most important to the group and should be addressed first. The primary difference between the results of multi-voting and the results of nominal group technique is that the improvement team considers the total point count for each item (adding up the values of each vote) as well as the number of votes each item received.

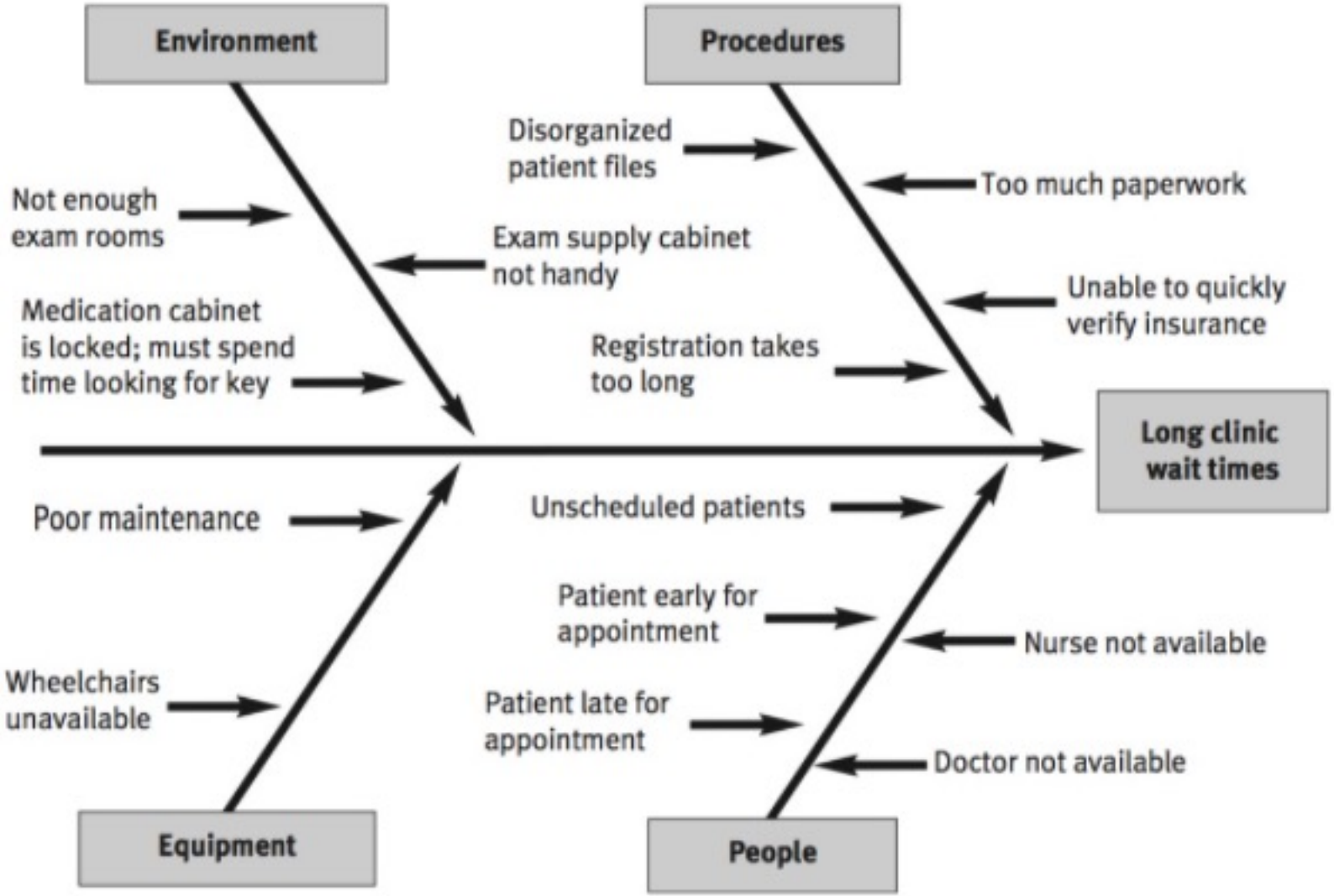
AFFINITY DIAGRAMS

1)
Affinity diagrams are used to organize large amounts of language data (ideas, issues, opinions) generated by brainstorming into groupings based on the relationships be-tween data items. This process helps improvement teams sift through large volumes of information and encourages new patterns of thinking. Affinity diagrams also help improvement teams identify difficult, confusing, unknown, or disorganized performance concerns.
To create an affinity diagram, team members write their ideas, issues, or opinions on separate pieces of paper or index cards and scatter them on a large table. Together, and without speaking, the team then sorts related ideas into no more than eight groups. Sorting the ideas into an affinity diagram should be a creative process, so the groups should not be named until later. This categorization process takes from 10 to 20 minutes, depending on the number of ideas.

2)
Once the ideas are sorted, the team names the groups by creating header cards and placing one at the top of each. The name should describe the thread or topic that ties the cards in the group together. The figure s a partially completed affinity diagram created by an improvement team in a hospital's business office. The team brainstormed the problems associated with billing errors and grouped these problems into categories.



Cause and effect diagrams are used to identify all possible causes of an effect (a problem or an objective). They are sometimes called Ishikawa diagrams after Kaoru Ishikawa, a quality pioneer who created and first used them in the 1960s for quality control purposes (Best and Neuhauser 2008). They are also called fishbone diagrams because the lines connecting major cause categories resemble the backbone of a fish. The figure is a cause-and-effect diagram created by an improvement team charged with reducing patient wait times in a clinic.



DECISION MATRIX Improvement teams can use a decision matrix (sometimes called a selection or prioritization matrix) to systematically identify, analyze, and rate the strength of relationships between sets of information. This type of matrix is especially useful for looking at large numbers of decision factors and assessing each factor's relative importance. Teams frequently use this tool to select improvement priorities and evaluate alternative solutions. In the case study involving Sunrise Home Health Agency in the previous chapter, the manager conducted a brainstorming session to solicit ideas on how to make monthly staff meetings more valuable to staff. Suppose the manager used a decision matrix (Table) to evaluate the suggested solutions more systematically. The staff's recommendations are listed in the first column. The criteria for evaluating each solution are listed across the top of the remaining columns. The manager asks each staff member to score the solutions according to the ranking key. The scores are then tallied, and a group average is calculated for each solution. Solutions with the highest group average are selected for implementation.

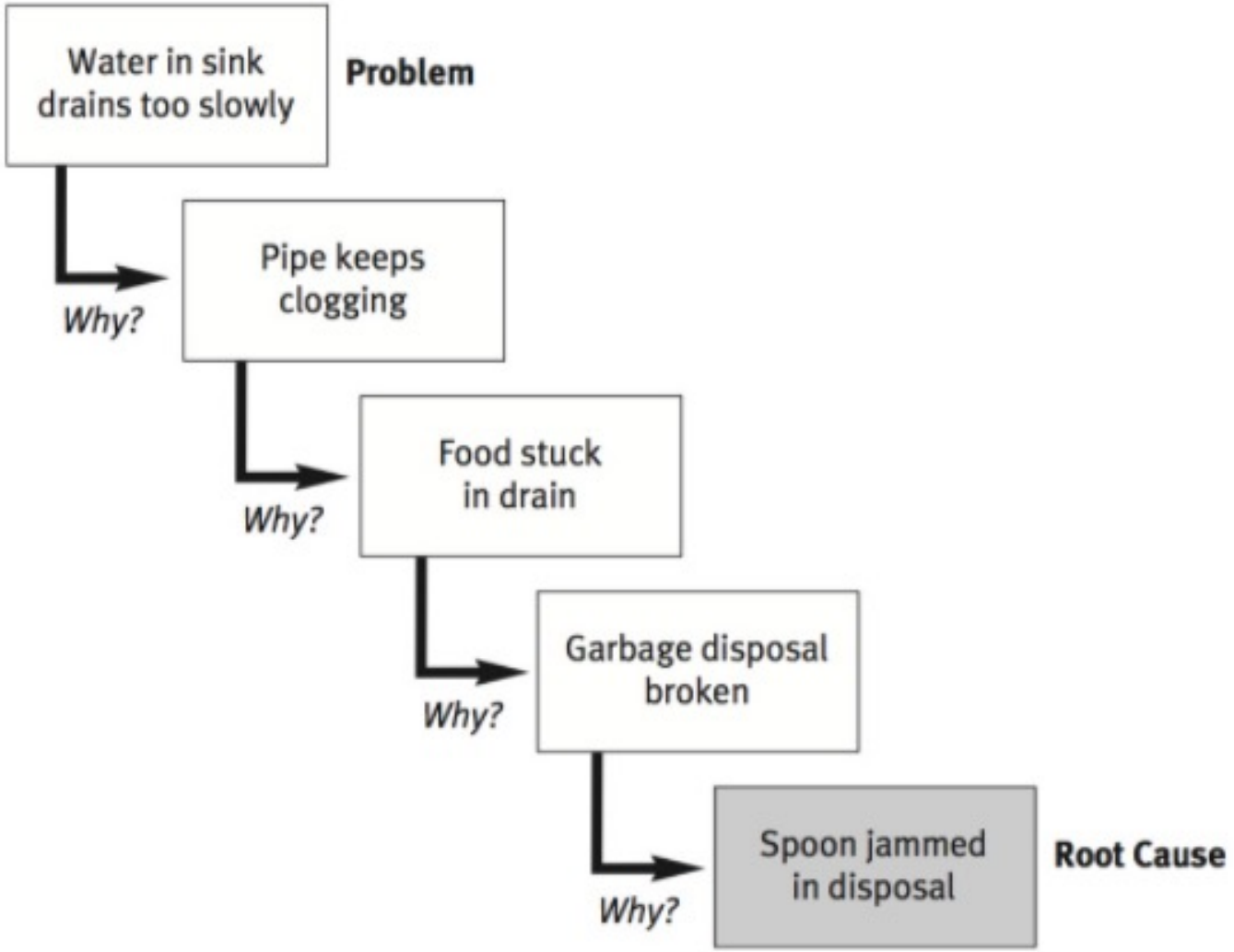
	Evaluation Criteria				*Your Total*	*Group Average*
Proposed Solution	*Probability of success*	*Ease of implementation*	*Cost-effectiveness*	*Impact on staff satisfaction*		
Hold online meetings						
Start meetings on time						
Create meeting agenda						
Allow staff to suggest agenda items						

Ranking key: 4 = excellent; 3 = very good; 2 = satisfactory; 1 = poor

FIVE WHYS

Before developing solutions, teams need to confirm they have found the underlying causes of a performance problem. The Five Whys tool helps an improvement team dig deeper into the causes of problems by successively asking what and why until all aspects of the situation are reviewed and the underlying contributing factors are considered. Usually by the time the team has asked and answered five why questions, it will have reached the core problem. Teams often uncover multiple, underlying root causes during this exercise.

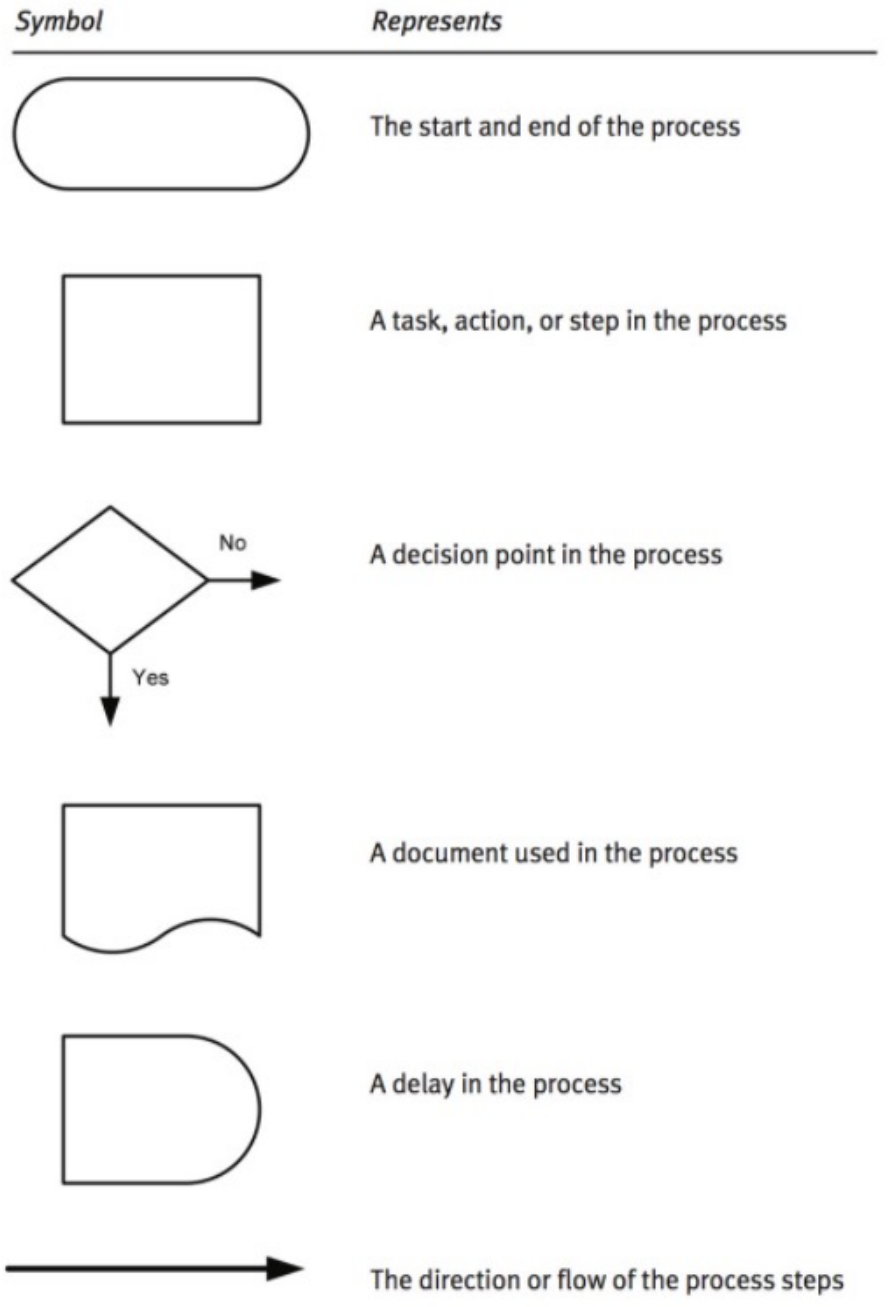
The following figure is an illustration of the Five Whys process for a common problem—water in a sink is draining too slowly. The root cause is eventually discovered by asking why repeatedly.



Flowcharts

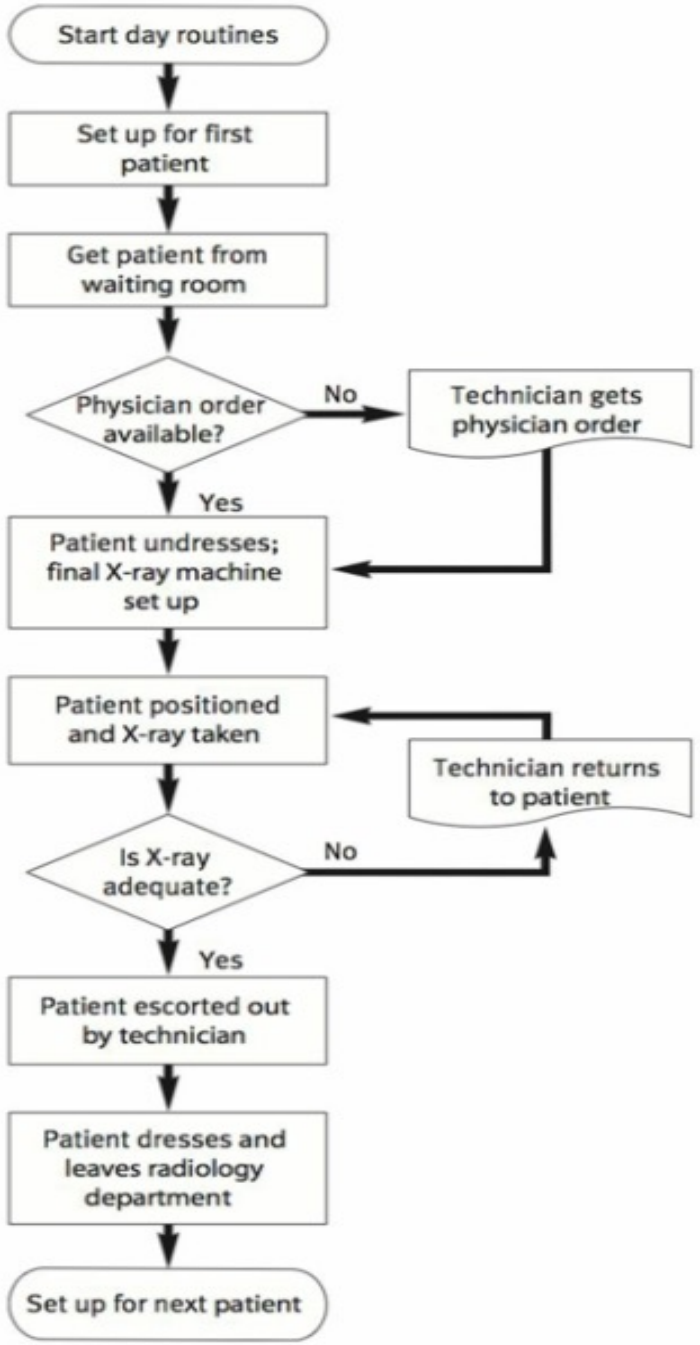
It sometimes referred to as process maps, are used to identify and document the flow or sequence of events in a process or to develop an optimal new process during the solution stage. They can be used to detect unexpected complexity, problem areas, redundancies, unnecessary steps, and opportunities for simplification. They also help teams agree on process steps and examine activities that most influence performance. Standard flowchart symbols are shown in the following Table. When developing a flowchart, especially in a group environment, the goal is to illustrate the process. After identifying the process adversely affecting performance, the improvement team defines the beginning and end of the process and the steps between these two points. It then sequences the steps in the order they are executed. The flowchart should illustrate the process in its current state—the way it is operating at that moment. When the team is satisfied that the chart represents the process accurately, it asks questions to locate improvement opportunities:

- Can any steps be eliminated?
- Can any steps be combined with others?
- Can any steps be simplified?
- Can delays in the process be eliminated?
- Can rework loops be eliminated?
- Can buildup of paperwork be minimized?
- Can handoffs between people or departments be streamlined?



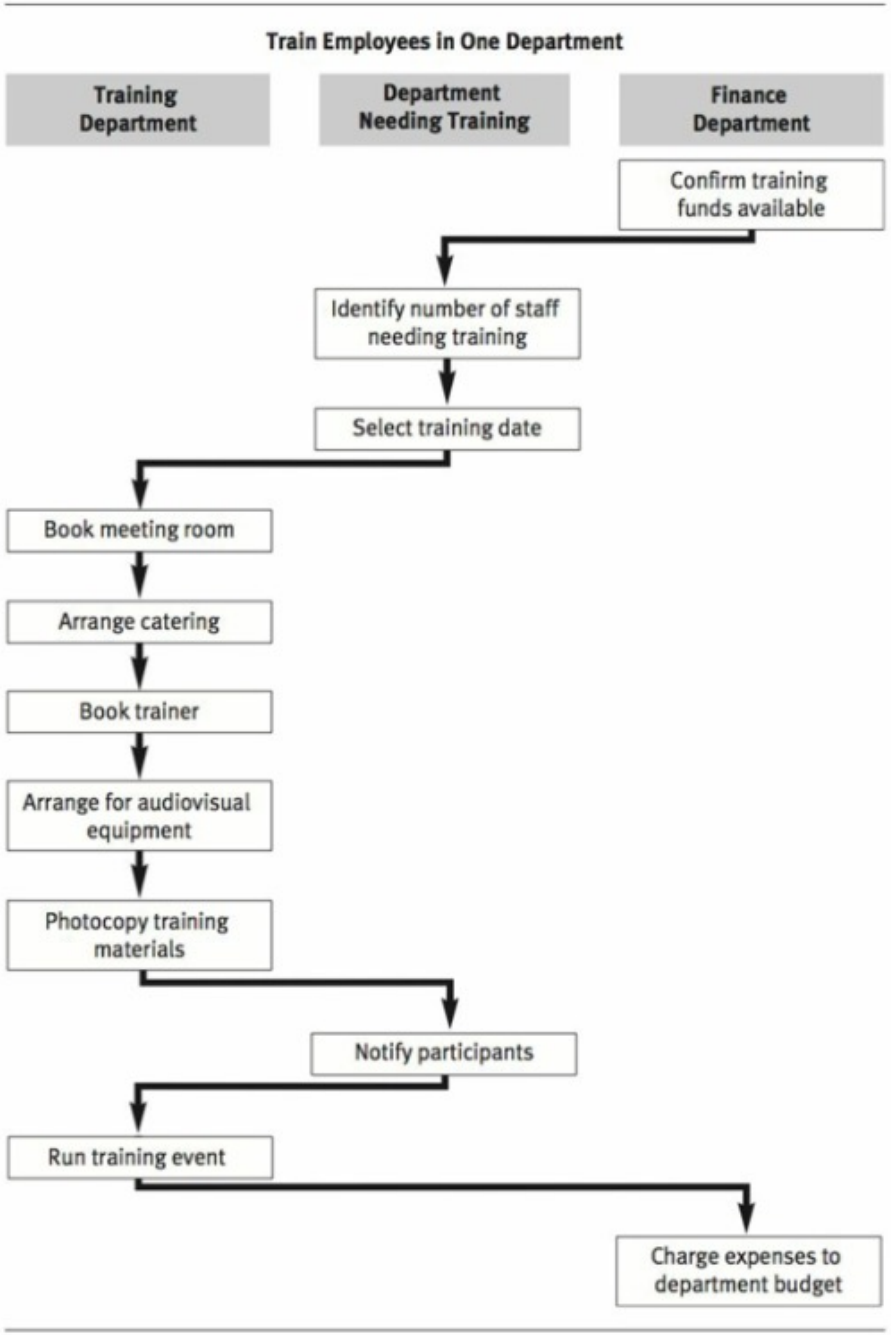
Detailed Flowchart

A detailed flowchart maps all the steps and activities that occur in the process and includes decision points, waiting periods, tasks frequently redone, and feedback loops. The Figure is a detailed flowchart of the patient X-ray process. his type of flowchart is particularly useful for looking for problems or inefficiencies. For example, the flowchart in Figure shows that delays occur when physician orders are not readily available to the X-ray technician. Delays also occur when X-rays have to be retaken for technical reasons. This flowchart was taken from a Lean project that was implemented to reduce inefficiencies in the process. From this flowchart, the team identified delays that could be eliminated by shifting some tasks to the radiology department's receptionists. The receptionists could confirm the availability of physician orders before patients enter the X-ray area. The receptionists also could retrieve missing orders and escort patients to and from the dressing room, freeing up even more time for the technician. These changes would streamline the technician's job, increasing productivity



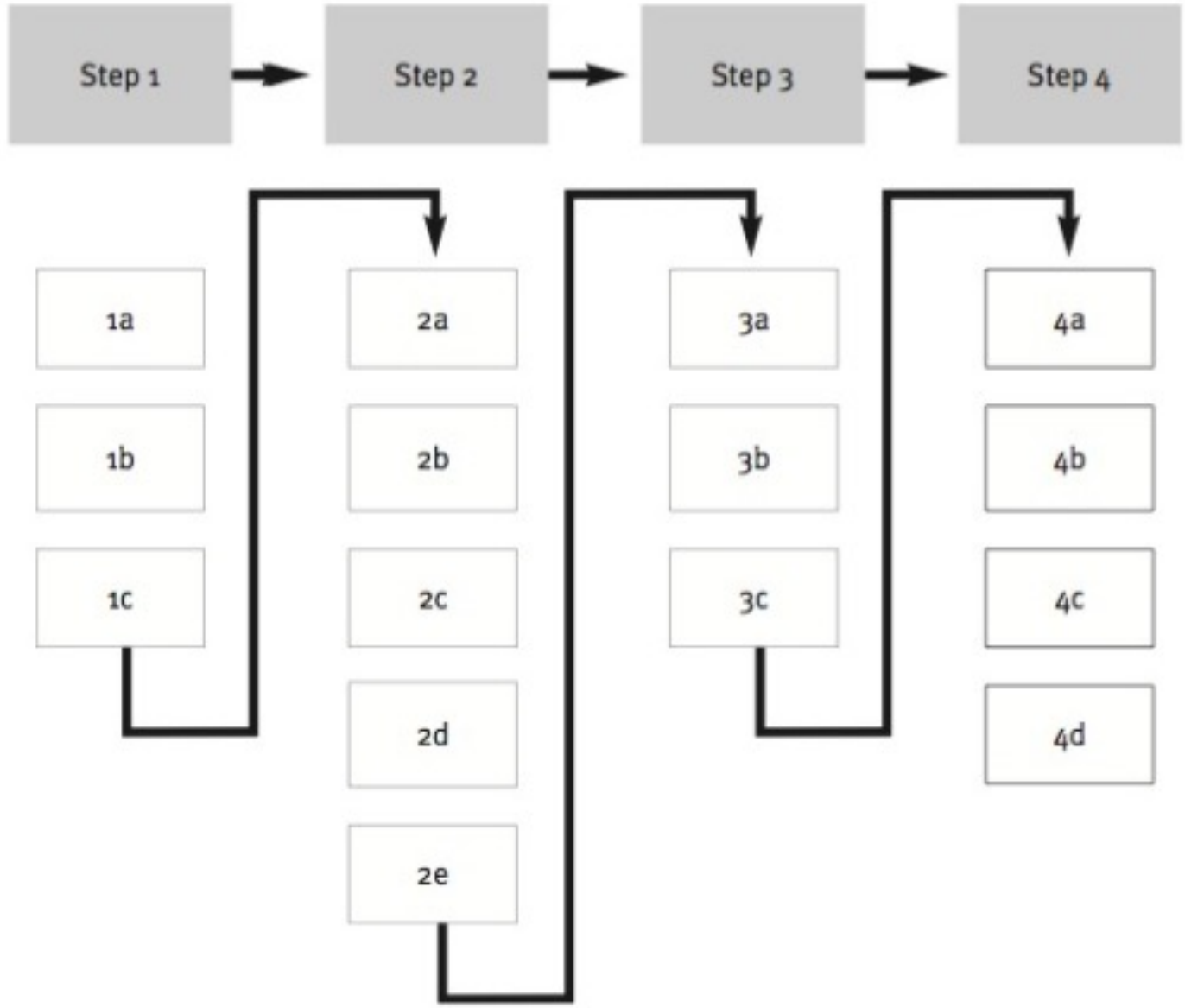
Deployment Flowchart

A deployment flowchart, shows detailed process steps and the people involved in each step. A deployment flowchart is particularly useful for map- ping processes in which information or services are passed between people and groups. They also may reveal unclear responsibilities, missing information, and unshared expectations that contribute to performance problems. Figure shown is a deployment flowchart of an employee training process. To create this flowchart, the improvement team listed the departments involved across the top of the chart. Next, it arranged the process steps in sequence and positioned each step in the column of the department that executes the step. The process steps are connected with arrows to show where the flow lines cross from one column to the next. A handoff occurs each time the flow line crosses from one column to another. The project team focused improvement solutions on the handoffs in the process because these transitions are prone to errors and miscommunication. Delays can happen at handoff points because people may not know when they can expect to receive something or that another group is waiting for them to complete a task.



Top-down Flowchart

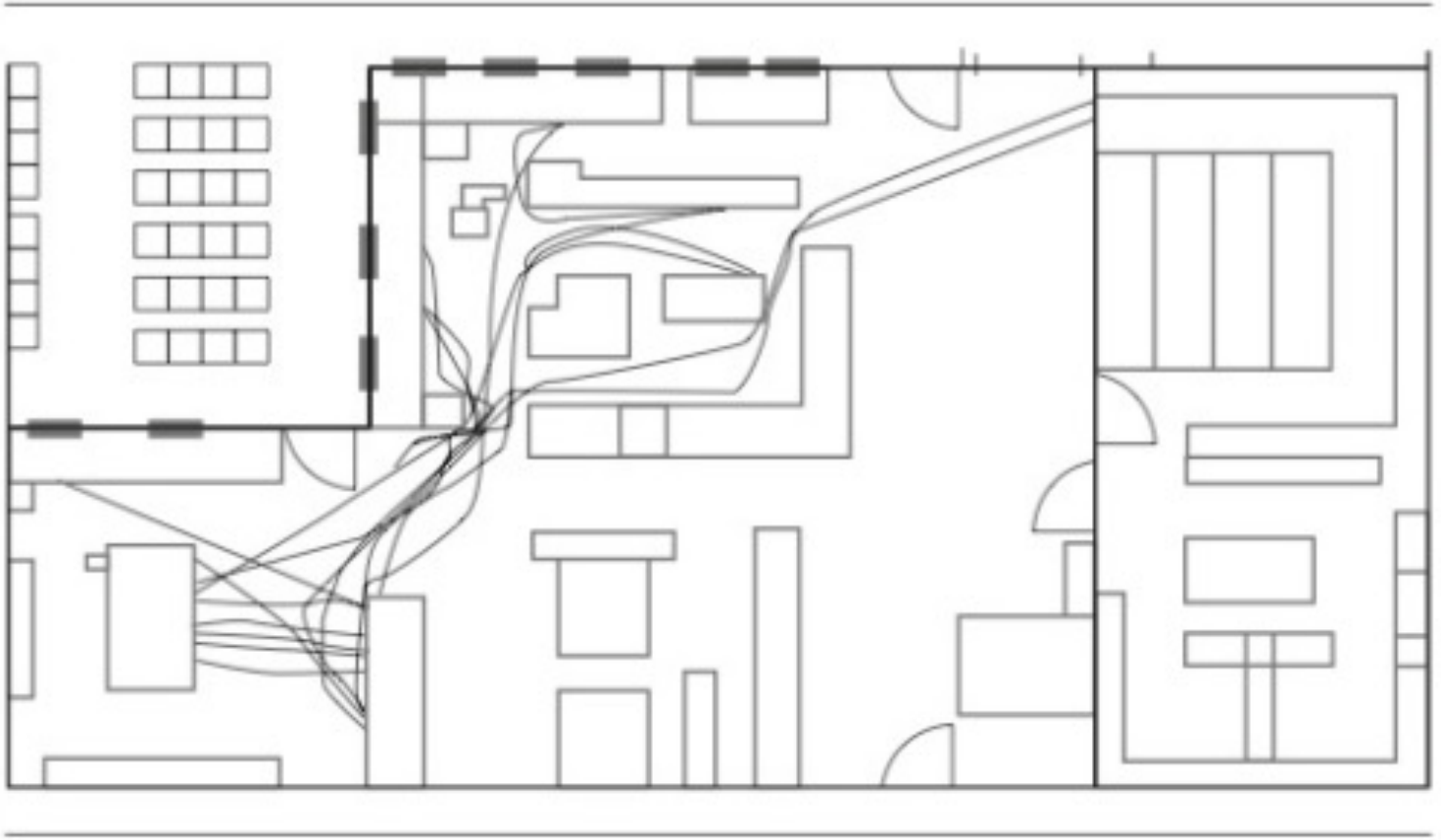
Top-down flowchart, the major steps in a process are arranged sequentially across the top and the detailed steps are listed under each major step (Figure shown). Unlike a detailed flowchart, a top-down flowchart does not include decision points or other steps that might be causing inefficiencies. A top-down flowchart is useful for viewing the process in a systematic manner to better understand the activities involved and their interconnectedness. Each type of flowchart has its strengths and weaknesses. To choose the best format for the project, the improvement team needs to understand the reason for creating the flowchart. If the team is unsure about the sub-steps in the process, it should create a high-level flow- chart. When the team understands the process sub-steps and wants to better understand how the steps are carried out, it should create a detailed, deployment, or top-down flowchart.



WORKFLOW DIAGRAM

A workflow diagram is a visual representation of the movement of people, materials, paperwork, or information during a process. The diagram can also illustrate general relationships or patterns of activity among interrelated processes (such as all processes occur- ring in the radiology department). Workflow diagrams are used to document how work is executed and to identify opportunities for improvement. A common type of workflow diagram is a floor plan of the work site. Lines are drawn on the floor plan to trace the movement of people, paper, data, etc., to identify redundant travel and inefficiencies. Figure shown is a floor plan of a hospital pharmacy department. The lines on the floor plan trace the movements of a pharmacy technician during the process of filling a prescription. To create this workflow diagram, staff from the quality department observed traffic flow in the pharmacy at 12:30 p.m. on a typical day.

The technician's movements are chaotic because of the layout of the department. The central medication supply is located in the middle of the pharmacy, and medications that are infrequently prescribed line the back wall of the department. The narrow walkway between the two sections causes delay and congestion because it comfortably accommodates only one person at a time. The resources needed to fill prescriptions are not easily accessible. Two printers in the lower left corner of the department, approximately 26 feet from the medication area, print prescription enclosures. The technicians must travel to this area through a narrow doorway. After studying the workflow in the pharmacy department, several changes were made to the department layout and the prescription receiving process.



Surveys (also considered a quantitative tool)

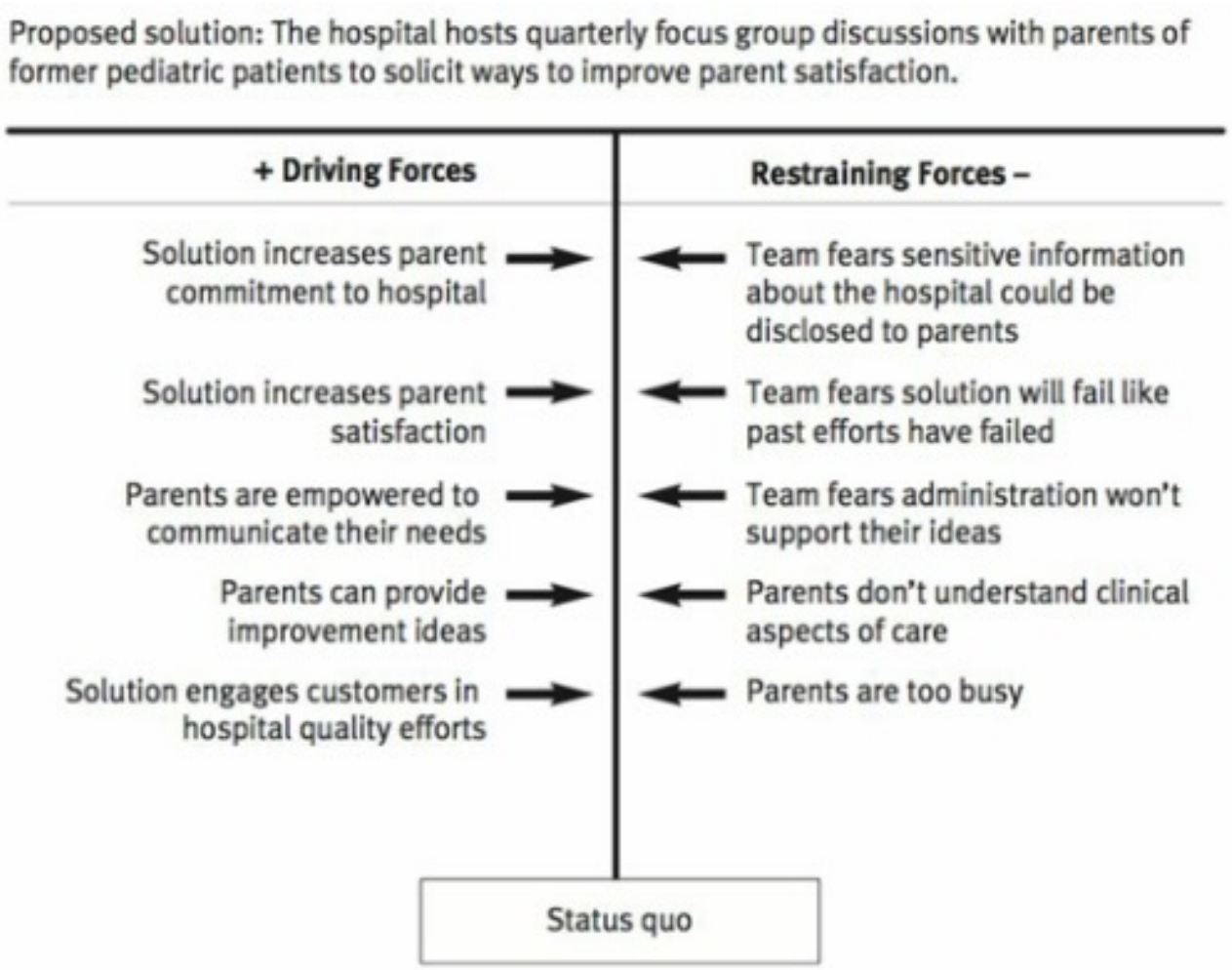
- Used to gather quantitative and qualitative information

Types of surveys

- Questionnaires: Paper or electronic instruments that the respondent completes independently
- Interviews: Conducted with the respondent face-to-face or over the phone

FORCE FIELD ANALYSIS

The purpose of force field analysis is to determine the potential support for and against a particular plan or idea. Once these "forces" are identified, plans can be devised to strengthen support for the idea and reduce resistance against it. Teams typically use force field analysis during the solution phase of an improvement project but may also use it to prioritize their improvement goals. Figure shown is a force field analysis completed by an improvement project team in a children's hospital. The goal of the project is to increase parents' participation in the hospital's quality improvement efforts. To achieve this goal, the team suggested that the hospital host quarterly focus groups with the parents of former patients to solicit ways to improve parent satisfaction. The improvement team uses the force field analysis to clarify current and desired participation and identify obstacles that could impede implementation of their proposal. The vertical line at the center of the diagram represents the status quo. Teams brainstorm to identify the driving and restraining forces and then decide which will most influence the outcome. They develop strategies to minimize the forces against, and strengthen the forces for, the desired outcome. Teams should focus on reducing or eliminating the restraining forces because they are usually more powerful and can prevent the change from being implemented.



STAKEHOLDER ANALYSIS

People usually resist change. If the improvement project team does not deal with this resistance, desired performance improvements may not materialize. Teams can use a stakeholder analysis to identify the individuals or groups that would be affected by a proposed process change. Each stakeholder is considered to deter- mine who would readily accept and who would resist the process changes. Stakeholders can be grouped into four main categories: allies, associates, enemies, and opponents. Not all will be affected by all stakeholders are equal; some have more influence on the outcome of the improvement plan than others. All of these factors are considered in a stakeholder analysis. A stakeholder analysis matrix (Table) helped the team predict each group's influence on project outcomes and its level of support. The individuals and groups that would be affected by the proposed changes to the process are listed in the first column. The team determines the specific interests these stakeholders have in the new process. The team considers such issues as

- benefits to the stakeholder,
- benefits to the stakeholder's patients,
- changes the stakeholder will have to make, and
- activities that might cause conflict for the stakeholder.

These issues are recorded in the "Stakeholder Incentives" column. Next, the team uses the following five-category ranking system to judge each stake- holder's support of the process change:
++ strongly in favor
+ weakly in favor o indifferent
− weakly opposed
−− strongly opposed

Process change: Radiology receptionists will confirm the presence of a physician's order before the patient enters the X-ray area. If necessary, the receptionists will obtain the missing order from the patient's physician. Also, receptionists will escort the patient to and from the dressing room.

Stakeholder	*Stakeholder Incentives*	*Stakeholder Support*	*Action(s)*
Radiology receptionists	• More work for receptionists • Reception area not staffed for extra duties	–	Do time study to determine how this change will affect receptionists' workload
Radiology technicians	• Less clerical work for technicians • Could reduce opportunities to interact with patients	++	Monitor patient satisfaction surveys to determine whether reduced interactions affect radiology department satisfaction scores
Radiologists	• Increased number of X-rays performed each day	++	No action needed; group supports the changes
Physicians who order X-rays	• X-rays completed more quickly • Possible disruptions if receptionist must obtain missing orders	o	Ask radiologists to discuss the benefits of the change with physicians
Radiology manager	• Need to reevaluate staffing at reception desk • Potential to reduce overall costs and improve productivity	+	Manager is skeptical that the change will actually reduce costs or increase productivity; need to evaluate these issues closely during pilot test

After ranking the stakeholders, the improvement team develops strategies for gaining stakeholder support, plans for all possible barriers to success, and decides how each stakeholder should be approached about the proposed change. What kind of information does the stakeholder need? Should the team involve the stakeholder in the project? Could any other groups or individuals influence those opposed to the change? The team records these ideas and actions it must take to further the project in the last column of the matrix.

Planning matrix

- Shows the tasks needed to complete an improvement activity, the people or groups responsible for completing the tasks, and the deadlines for completion

Gantt Chart: Graphic representation of a planning matrix

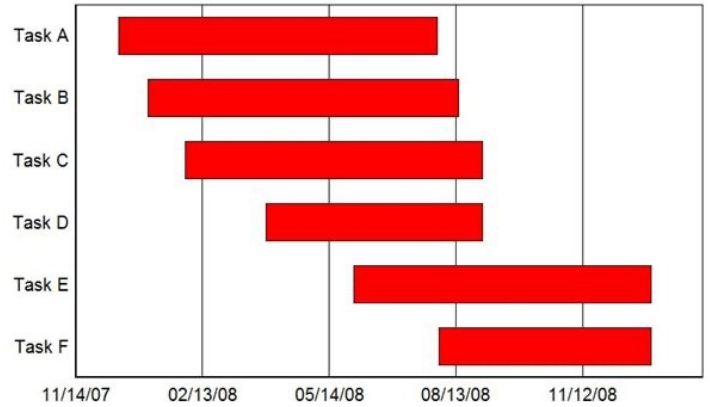


Table shown is a planning matrix for an improvement project involving changes to the patient registration process at Redwood Health Center. In hopes of reducing patient wait times, the team decides to implement a change to the registration process for new patients. The clinic will mail a registration form to all new patients who schedule appointments. Patients will be asked to bring the completed form on the day of their appointment. The project seems simple and straightforward, but the planning matrix reveals that the team must complete a number of tasks to implement the change successfully.

Task	*Responsible Person*	*Completion Date*
Design a self-explanatory clinic registration form and cover letter	Clinic manager	June 1
Share the form and cover letter with a sample of patients to determine whether the average patient would understand how to complete the form	Clinic manager	June 15
Revise the form and cover letter as necessary and send them to a printer for duplication	Clinic manager	June 30
Teach the new procedure to receptionists and staff in charge of scheduling	Front office supervisor	July 10
Provide staff with registration forms, cover letters, and a supply of envelopes	Clinic manager	July 15
Alert mail room staff to the new procedure and provide forwarding instructions for the registration forms they will receive	Front office supervisor	July 15

Quality storyboard

- Summarizes the major elements of a completed improvement project

Reducing the Delay in Discharges from a Tertiary Care Facility

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Introduction

Discharge planning - preparing to move the patient from one level of care to another within or outside the current healthcare agency.

A systematic and multifaceted process that should begin upon admission and continue throughout the hospitalization.

Objectives of discharge planning:

- Ensuring the continuity of implementing the therapeutic regimen
- Providing adequate teaching, instruction or additional demonstrations of procedures to manage the regimen
- Identifying and familiarizing the patient and family with appropriate resources for the continuity of care
- Actively involving the patient and family in the planning process, goal setting and decision making.

Aim

Unit-Specific Data Analysis for 5 South

April 2007 to September 2007:

- 1061 discharges; monthly average of 177
- 86.4% of discharges had a discharge appointment
- 34.9% left within the hour time frame
- Majority of the discharges occurred between 12 noon and 7 pm.

The inconsistency of placing anticipated orders the day prior to discharge is the primary reason for ineffective patient flow.

This project will develop and implement an evidenced-based practice that will decrease discharge delays as well as positively impact the overall goal of improving patient flow.

Method

Proposed test of change:

- On admission, estimate a length of stay and an anticipated discharge date based on the patient's DRG, plan of care and clinical pathway.
- Conduct discharge planning and update the plan of care daily.
- Revitalize the use of the pre-discharge checklist (see below) as a discharge progress log for all staff.
- Work with the patients to identify specific discharge needs; work along with other clinical staff and family to have them resolved by the day before discharge.
- On the day prior to discharge, decide upon a realistic and reasonable discharge appointment time and obtain anticipated discharge orders.
- On the day of discharge, carry out the final discharge orders and have the patient discharged by no later than one hour after the designated appointment time.

There will be a 3 month implementation of this test of change from January 2008 to March 2008. Data related to discharge appointment times and actual time of discharge will be collected.

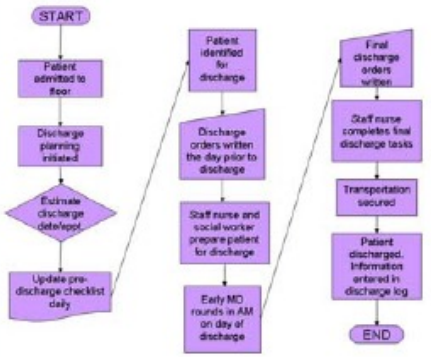
Results

Evaluation of project:

A comparison of unit-specific data will be conducted using information from both the 2007 data analysis and the 2008 project.

The test of change will be considered successful provided the following goals are achieved:

1. Increase in the number of patients having a discharge appointment to 95%.
2. 90% of the appointments scheduled between 10 am and 2 pm.
3. Increase in the number of patients leaving within an hour of the appointment time to 55%.



Conclusion

Discharge planning is fundamental to the timely, efficient and effective transition of the patient through the healthcare system.

All members of the interdisciplinary team must be organized, collaborate effectively and utilize adequate communication in order for the process to be successful.

An evidenced based practice which serves to reduce the inconsistencies and delays arising within the discharge planning process is essential.

This practice will not only result in improved patient flow but will also positively impact both staff and patient satisfaction and will serve as a measure of the quality of care rendered.

Continuous Quality Improvement

Involves monitoring and evaluating all aspects of processes and outcomes in order to improve upon them.

Contact Information

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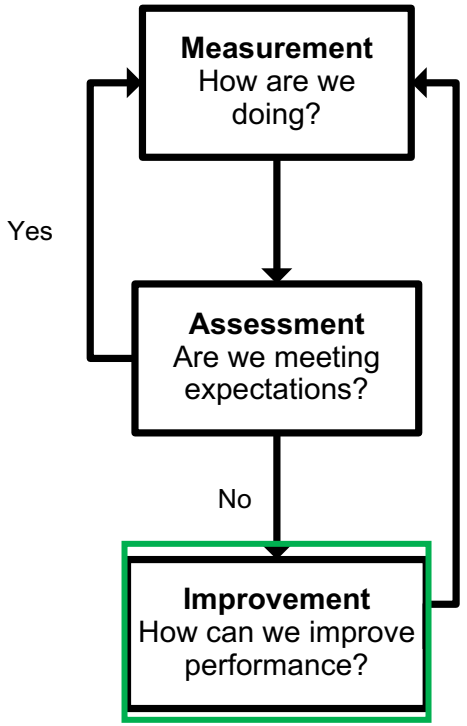
Recap: Two Types of Tools

- Quantitative tools
  - Used for measuring performance, collecting and displaying data, and monitoring performance

- Qualitative tools
  - Used for generating ideas, setting priorities, maintaining direction, determining causes of problems, and clarifying processes

Improvement Tools



Help to answer these questions:

- How does the process work now?
- What can we improve?
- How do we improve it?
- How should we measure and track performance?