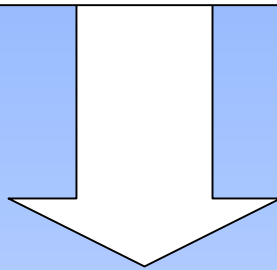# IV. How to Make a Project Work
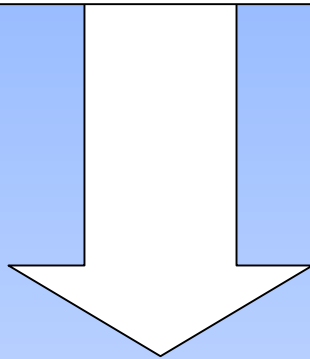
Investigate the Process

⬇

- Describe the process or problem

- Localize problems

- Look for root causes

- Test and refine data collection procedures

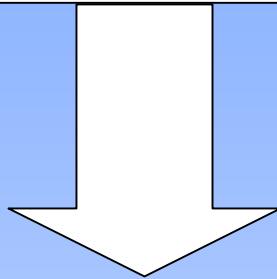Scholtes, P.R., Joiner, B.L., Streibel, B.J. (1996) *The Team Handbook*. Joiner, Madison WI

Analyze Data & Seek Solutions

⬇

- Look for patterns in the data

- Explore alternative solutions

- Develop strategy for further improvement

Scholtes, P.R., Joiner, B.L., Streibel, B.J. (1996) *The Team Handbook*. Joiner, Madison WI
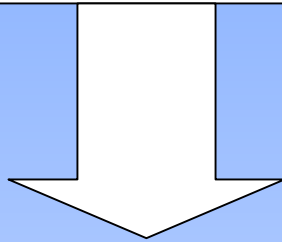
Take Appropriate Action

- Design or redesign product or process

- Standardize procedures

- Stabilize process

- Monitor the results of all changes - evaluate and refine as needed
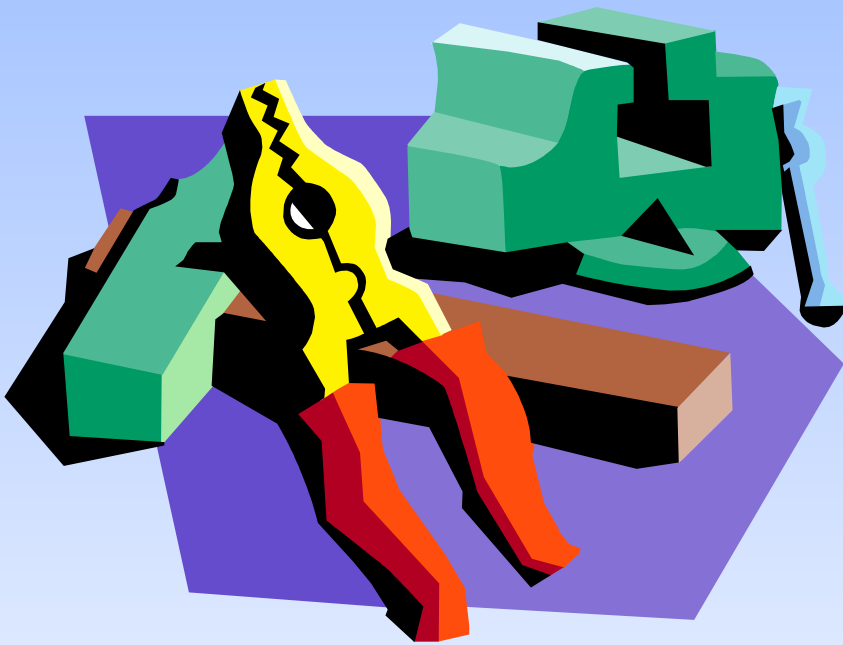
- Document progress

Analyze Data & Seek Solutions

- Evaluate the team's process

- Evaluate the team's results

- Organize files

- Update records and storyboard

- Make final presentation

- Recommend follow-up activities

Scholtes, P.R., Joiner, B.L., Streibel, B.J. (1996) *The Team Handbook*. Joiner, Madison WI
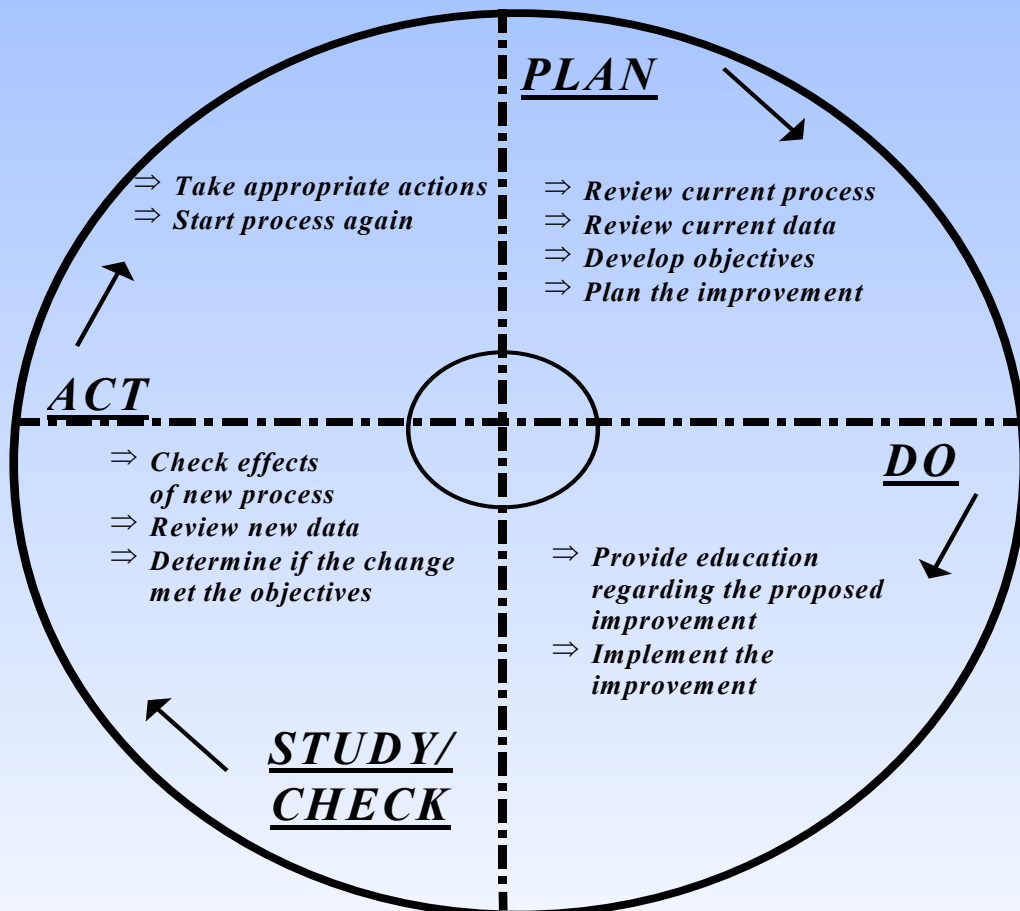
PI Tools

Introduction

There are several tools and techniques that can help a team move a project forward. This section outlines how six such tools and techniques can be used. Some projects may require the use of all of these tools whereas others may not. All of these tools are easy to use, and their common uses and guidelines for creating them are outlined in this section.

Overview of the Improvement Cycle Model

Improvement efforts tend to be more effective when a systematic process is followed. MetroHealth utilizes Dr. W. Edwards Deming's model for improvement known as "Plan, Do, Study or Check, and Act." This model is frequently referred to as "PDSA" or PDCA."

> The PDSA/PDCA cycle is a series of activities for improvement, starting with
> *__PLAN__* The Improvement - *__DO__* The Improvement -
> *__STUDY/CHECK__* The Results - *__ACT__* To Hold The Gain

__PLAN__

⇒ *Review current process*
⇒ *Review current data*
⇒ *Develop objectives*
⇒ *Plan the improvement*

__ACT__

⇒ *Take appropriate actions*
⇒ *Start process again*

__DO__

⇒ *Provide education regarding the proposed improvement*
⇒ *Implement the improvement*

__STUDY/ CHECK__

⇒ *Check effects of new process*
⇒ *Review new data*
⇒ *Determine if the change met the objectives*

PI Tools Used During the Improvement Cycle Steps

There are several PI tools that are commonly used during the various steps of the improvement cycle as outlined below.

Brainstorming: Plan, Study/Check, Act phases

Multivoting: Plan phase

Flow Charting: Plan phase

Fishbone Diagram: Plan, Study/Check phases

Suggested ways that these tools can be used are further discussed under the sections describing each of them.

Implementing the Improvement Cycle

Teams can use the PDSA/PDCA improvement cycle by breaking the improvement into small steps and implementing the cycle for each of these steps (Figure 1) or by planning the improvement in its entirety and implementing the entire improvement as a single cycle (Figure 2).
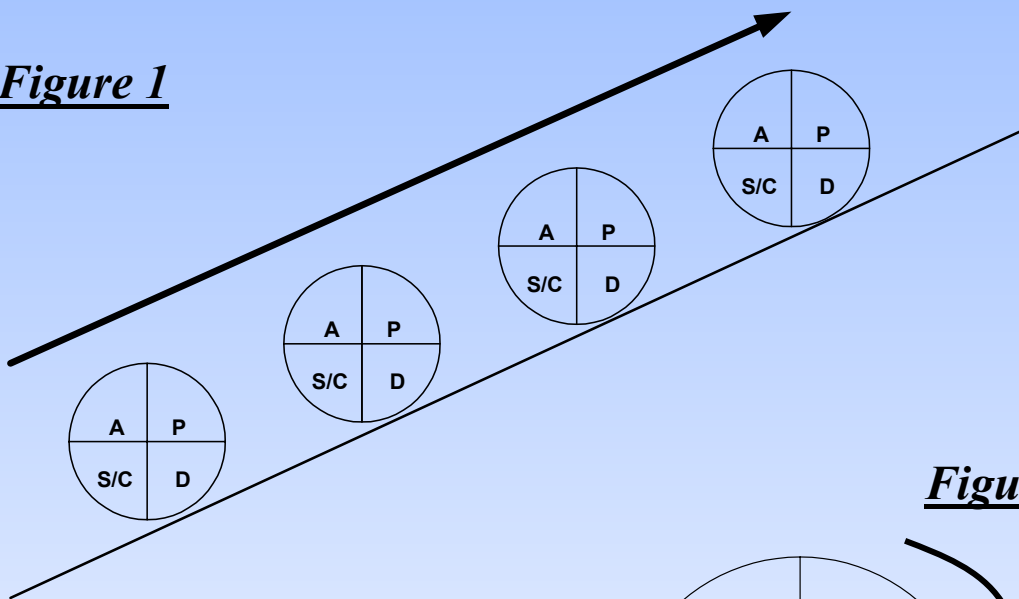
Figure 1

A	P
S/C	D

A	P
S/C	D

A	P
S/C	D

A	P
S/C	D

Figure 2

A	P
S/C	D

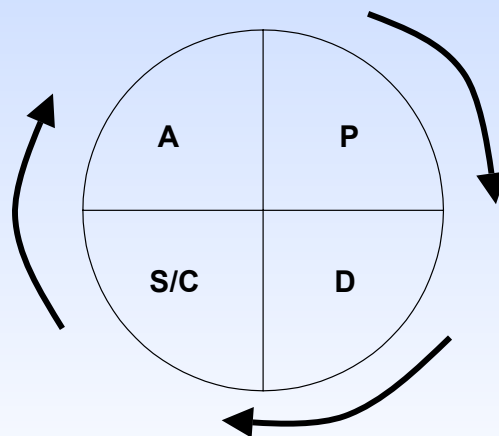# *Implementing the Improvement Cycle (cont.)*

- Multiple Small PDSA/PDCA Cycles
  - Generally preferred especially if change is large or complicated
  - Achievements more noticeable
  - Initial changes can be made rapidly
  - Can run cycles sequentially or concurrently
- Single PDSA/PDCA Cycle
  - Appropriate for smaller projects

Brainstorming

Brainstorming is a PI tool that can

- Generate many ideas in a short period of time
- Allow for contributions by each team member
- Be more effective than generating ideas as individuals

It is commonly used during the Plan phase for activities such as identifying:

- Problems with the current system
- What the ideal process should look like

It also can be used during the Study/Check and Act phases to help identify problems with the new system and to identify next steps and future actions.

Brainstorming ~ Ground Rules

- Want ideas to be free flowing but controlled

- Everyone to participate

- One idea per turn

- Avoid making judgements regarding the ideas (e.g., won't work, groans, great idea, etc.)

- Defer discussion of the merits of the ideas until later

- If an idea is already on the board, don't need to give it again

- O.K. to pass

- Keep to task at hand and avoid side-conversations

Brainstorming ~ Supplies

- Paper and writing utensils so participants can jot down their ideas

- Equipment to record ideas such as flip chart and markers *or* overhead projector, blank transparency, a screen or blank wall and markers *or* lap top computer, LCD projector, screen and a good typist.

- Tape to secure flip chart pages to the wall (if the flip chart method is used) so that all ideas can be displayed should multiple pages be needed

Multivoting

Multivoting is a PI tool that helps

- Determine the most popular or most important idea(s) from a list generated by brainstorming

- A group come to consensus rather than using "majority rules"

Multivoting systematically reduces the list of options, and when it is used, there are less likely to be outright "winners" and "losers."

Multivoting is commonly used during the Plan phase for activities such as identifying:

- The most important issues

- Which issue to work on first

Multivoting ~ Supplies

- Flip chart pages with ideas that have been brainstormed
- Colored adhesive dots (at least 2 different colors) or colored markers (at least 2 different colors)

Multivoting ~ Process

- Review the items on the list
- Clarify items that are not clear but avoid discussion of the merits of the items on the list
- Combine items that are the same
  - People who gave the 2 items should agree that they are in fact the same
  - Do not overuse this option

Multivoting ~ Process (cont.)

- To figure out the number of votes that each person should get, count # of items and divide the total by 3 (rounding off to the nearest whole number) in order to reduce the list to a manageable number.

- Give time for everyone to think about their top choices and encourage them to write down their choices

- Voting can be done by having each person
  - Put a check mark or a colored adhesive dot by each of their selections

Multivoting ~ Process (cont.)

- Cross off items getting no or fewer votes
- Repeat voting process
- Count remaining items and divide by 3
  - Everyone votes again using a different colored marker or different colored adhesive dot
  - Repeat process until either a clear winner or only a very few items left (you may need to recopy the list after a few rounds of voting to avoid confusion)
  - If there is no clear winner, group may need to discuss the merits of the last few remaining items and take a vote using a show of hands to identify the "winner" or top choice.

Flow Chart

A flow chart is a PI tool that

- Helps identify all the steps in a process by using standard symbols and arrows (see Symbols page)

- Can help to illustrate redundant steps

- Can highlight differences in the process among individuals/groups

- Can show the changes between an "old" and "new" process

Flow charting is commonly created during the Plan phase for activities such as:

- Describing the current process

- Designing the proposed process

Additionally, a flow chart of a new process can be used when educating staff about the new process during the Do phase.

Flow Chart ~ Supplies

When developing a flow chart, you will need

- Flip chart

- Markers

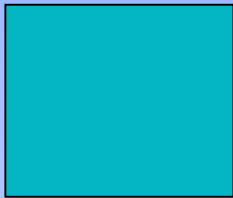- Self-stick Notes

Once a flow chart has been developed, it can be redrawn on paper either by hand or by using word processing software.

Flow Chart ~ Symbols
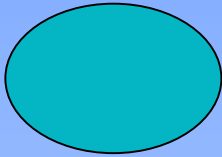
= "Start" or "End" of process (an oval that contains the word "Start" or "End")

= Process step (a rectangle)
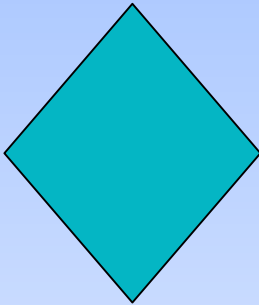
= Decision (a diamond)

= Connector (a small circle that contains a letter)

= Direction flow for process (a line and arrow)

Flow Chart ~ Example Process for Test Follow-up

```
    ( Start )
        |
        v
  +-------------+
  | Review test |
  |   results   |
  +-------------+
        |
        v
    < Abnormal? >  --Yes-->  +-------------+  -->  < Able to >  --No-->  ( A )
        |                    | Call patient |      <  reach?  >
        |                    +-------------+         |
       No                                           Yes
        |                                            |
        v                                            v
  +-------------+                            +-------------+
  | Send letter |                            | Arrange for |
  | to patient  |                            |  treatment  |
  +-------------+                            +-------------+
        |                                            |
        v <-----------------------------------------+
    ( End )
```
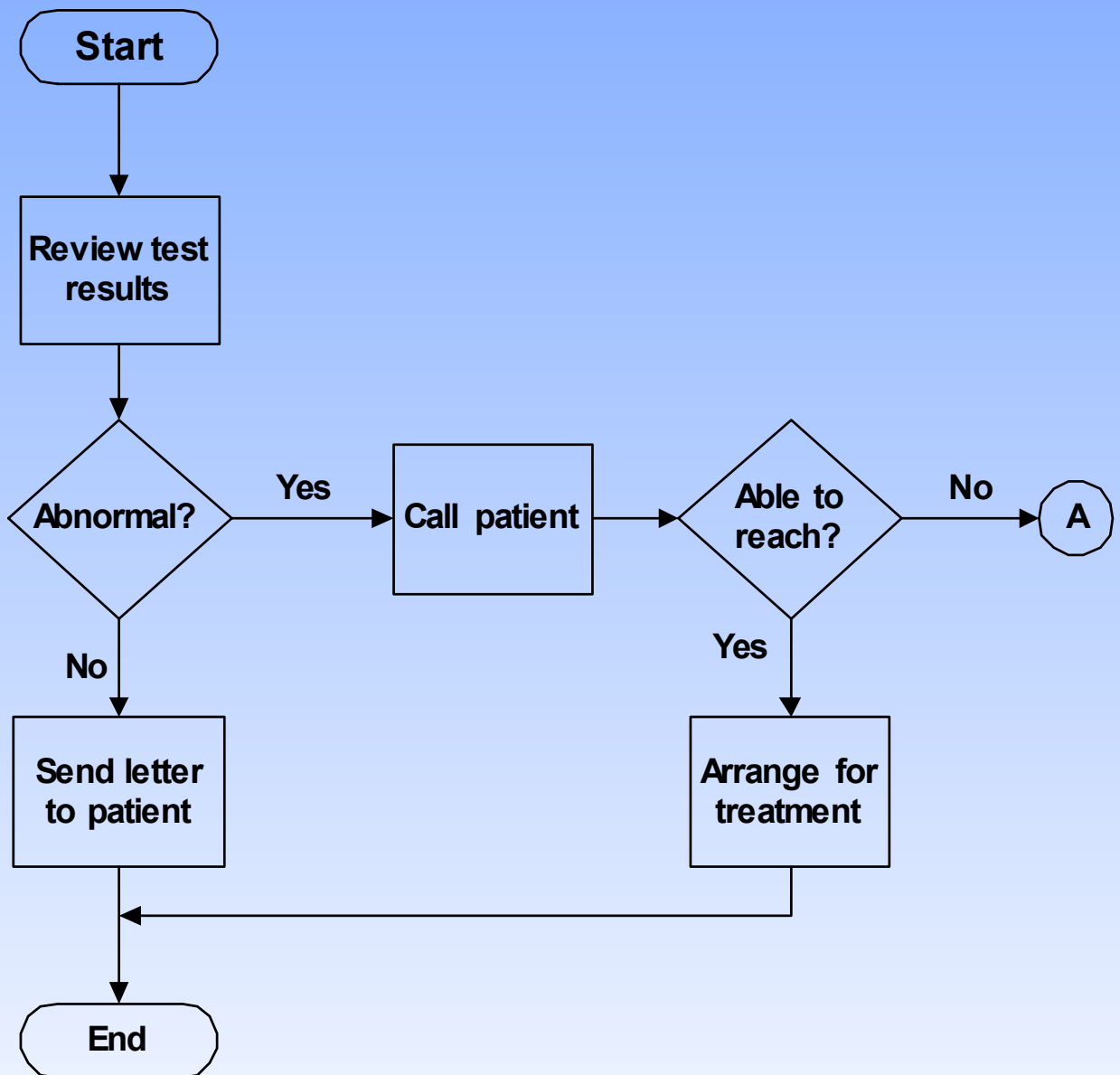
Flow Chart ~ Example
Process for Test Follow-up (cont.)
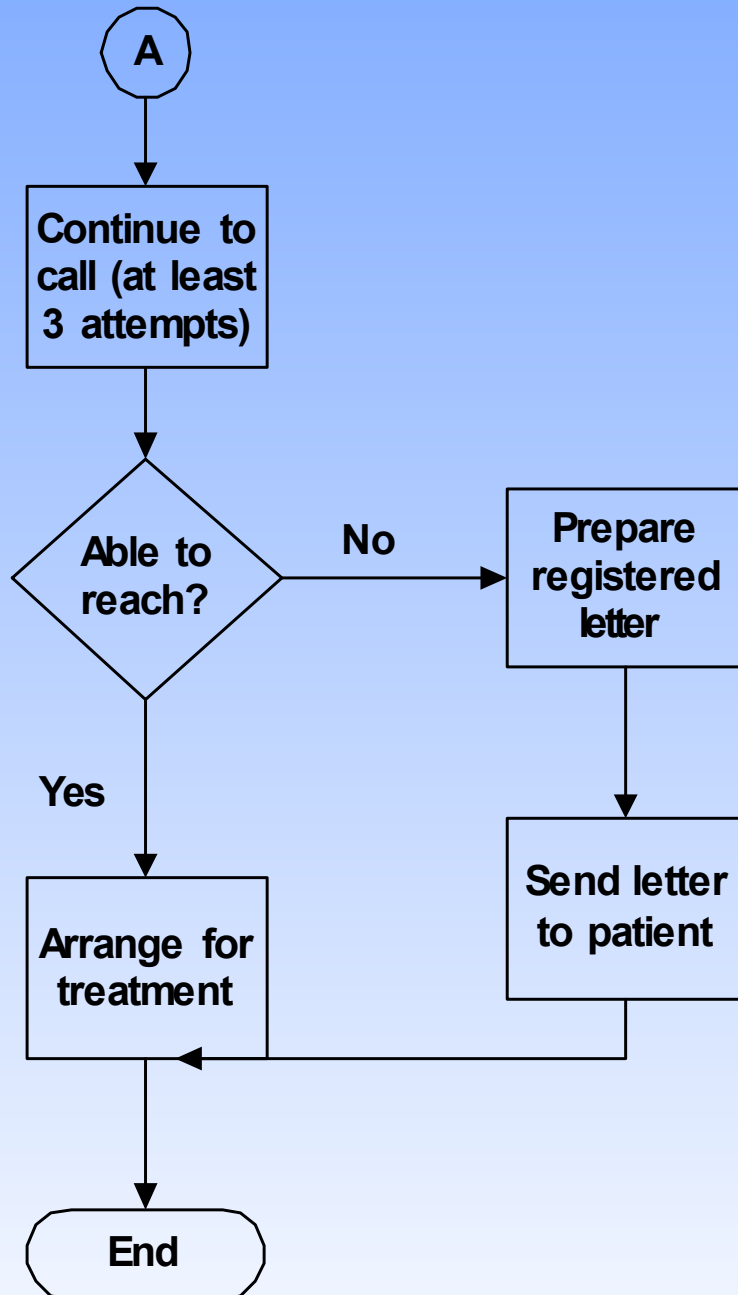
Flow Chart ~ Process

- Clearly define what
  - part of the process is to be charted before you begin (i.e. where the process starts and ends)
  - perspective that the flow should be drawn (e.g. from the patient's perspective vs. from the staff member's perspective)
- Solicit group's input as to various steps
- Write steps on self-stick note & place it on the flip chart page
- Move notes around if other earlier steps are identified at a later time
- Once you have consensus regarding order of steps, connect self-stick notes with lines and arrows

Flow Chart ~ Additional Hints

- There is no such thing as a "perfect" flowchart

- Keep it simple

- Think in broad terms (i.e. major steps) to start and then add details

- Create the flow chart of current process before thinking about changes to the current process

- Self-stick notes can make it easier to move steps around

- Validate that this is how the process actually works *(and not just how you think or hope that it works)*

Cause & Effect Diagram

A cause and effect diagram is a PI tool that

- Identifies, organizes and displays the possible causes of a specific outcome
- Shows how the causes or factors relate to each other
- Gives you the "big" picture

This tool was developed by Kaoru Ishikawa and is also known as an Ishikawa diagram or fishbone diagram.

A cause and effect diagram is commonly created during the Plan phase when identifying reasons for problems with the current process and when selecting what a team might want to work on. It also can be used during the Study/Check phase as the team evaluates what may still be wrong with the new process.

Cause & Effect Diagram ~ Supplies

- Paper and writing utensils so participants can jot down their ideas

- Flip chart and markers to record ideas

- Tape to secure flip chart pages to the wall so that all ideas can be displayed should multiple pages be needed

- A completed diagram can be recreated by drawing by hand, by using word processing software (with some difficulty) or by using software that has been specially designed to create these diagrams.

Cause & Effect Diagram

Causes

Causes

Effect
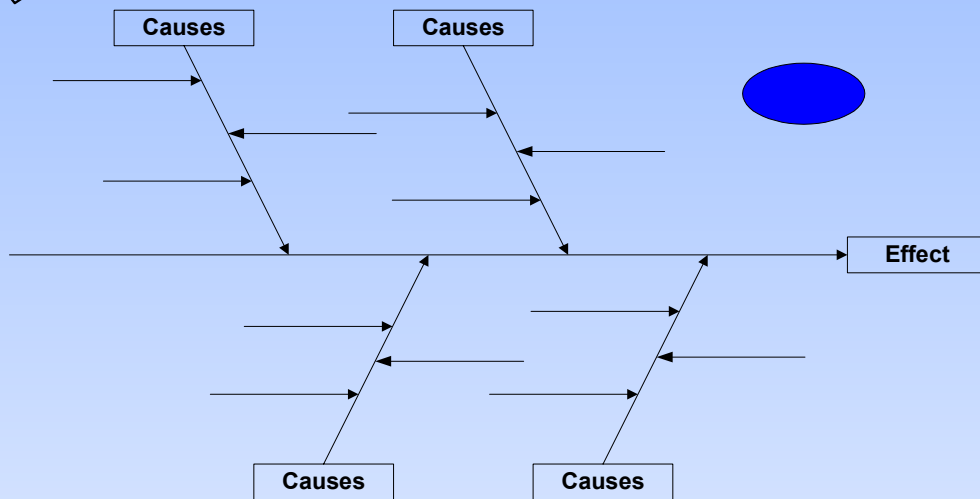
Causes

Causes

Cause & Effect Diagram ~ Sample Causes Leading to Delays with a Surgical Procedure

Staff

Environment

Surgeon late

Computer system down

Inadequate staff

Inadequate number of rooms

Nursing

Anesthesia

Housekeeping

Room needs to be cleaned

Surgeon still working on previous case

Previous case not done

Surgery starts late

Patient arrived late

Inadequate prep

Consent not signed
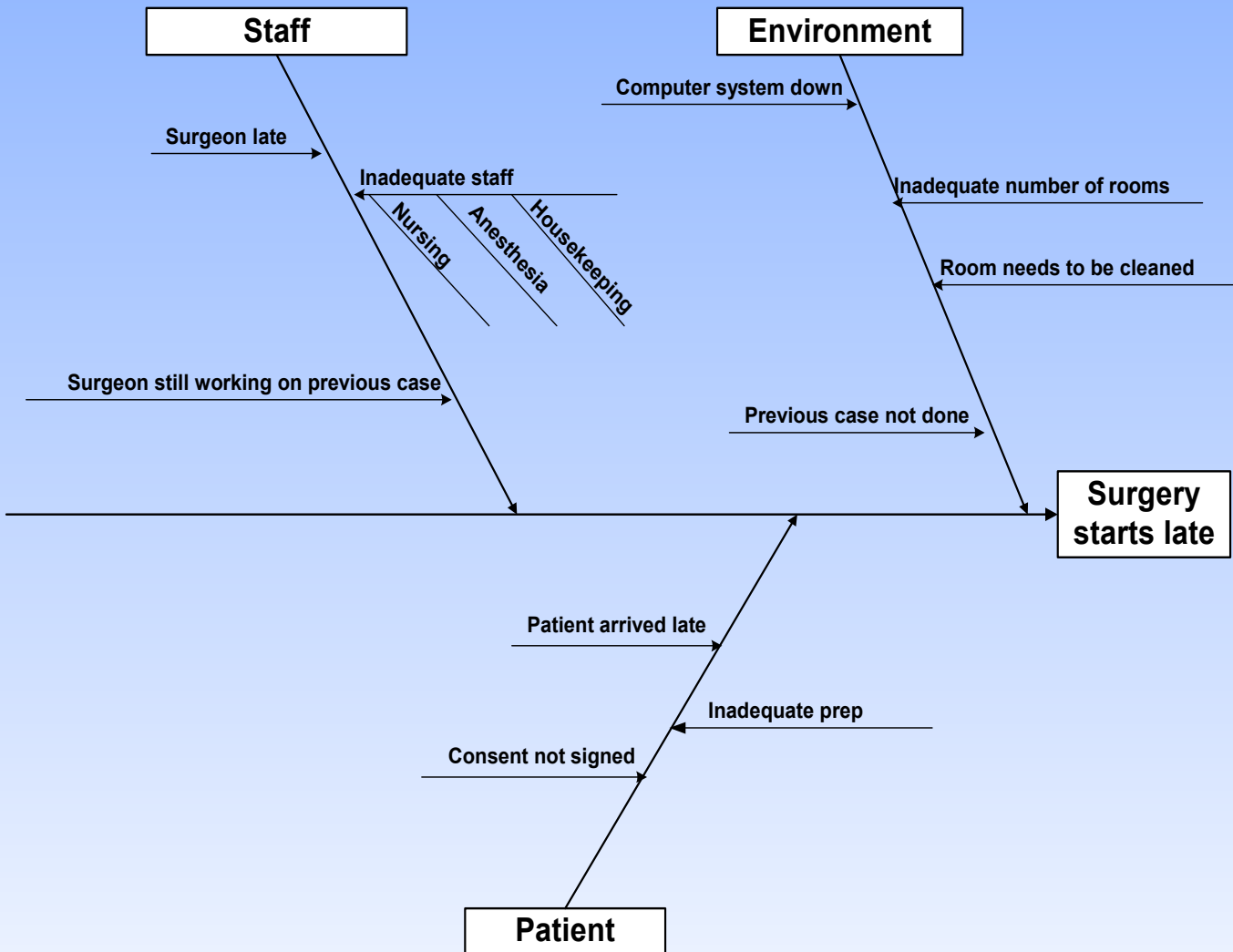
Patient

Cause & Effect ~ Process

- Identify an outcome or effect that you want to study

- Use either a positive or negative framework such as

  – What elements contribute to good patient satisfaction? (positive framework)

  – What are the causes of poor patient satisfaction? (negative framework)

  – Regardless of which framework is used, the causes and effects must correlate (e.g. if the effect is stated in the negative then the identified causes should be what contributes to that negative cause and not what may make the negative cause go away)

- Brainstorm ideas for possible causes following usual brainstorming techniques

- Review list of potential causes

Cause & Effect ~ Process (cont.)

- Eliminate/combine any duplicate causes
- Identify some general categories for the listed items such as
  - By causes: People, Equipment, Methods, Materials, Work Environment
  - By characteristics: Accuracy, Courtesy, Proficiency, Ease of Use, Time
  - According to issues associated with the various steps of the process (from start to finish)
- Review the list and identify which category best describes the item
- Draw a blank cause and effect diagram on the flip chart
- Fill in the "Cause and the Effect" "Categories"
- List the ideas on the diagram under the appropriate "Cause Category"

Cause & Effect Diagram ~ Additional Hints

- Some identified causes may fit under more than one category. In order to avoid creating a diagram that has so many causes that it is difficult to read, encourage the team to select the "best" category and not to put the same issue on the diagram multiple times.

- The process of identifying potential causes should be a team activity preferably at a team meeting. However, in the interest of time, the processes of classifying the causes and drawing the diagram can be done by the team leader and/or facilitator outside of a team meeting.   The completed diagram should then be brought back to a team meeting so that the team members understand this tool, see how it can be used and have the opportunity to add causes and finalize.

- The number of causes in a particular category may give a hint where to begin activities but be careful in drawing firm conclusions without data on how often these causes actually occur.

Time Line/Gantt Chart

A time line is a PI tool that can:

- Track a team's progress or lack thereof
- Motivate the team by reminding them of their accomplishments
- Summarize the steps that were taken to accomplish an improvement
- Document steps taken to date and illustrate the amount of time that was devoted to the steps
- Set goals for completion of steps at onset of project

Supplies

Graph paper or spreadsheet software (see example)

Time Line/Gantt Chart ~ Sample

Time frames can be weeks, months, quarters, etc.

Date & Week #		Date 1	Date 2	Date 3	Date 4	Date 5	Date 6	Date 7	Date 8	Date 9	Date 10	Date 11
		1	2	3	4	5	6	7	8	9	10	11
Major Milestones												
Step 1		▓										
Step 2		▓			Shade Time for Step Completion							
Step 3		▓										
Step 4		▓	▓									
Step 5			▓									
Step 6			▓									
			▓		▓	▓						
				▓								
							▓					
									▓			
										▓	▓	▓
										▓	▓	▓
										▓	▓	▓

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