MODULE 15: A FOCUS ON MEASUREMENT: PART II

Module Introduction

Module 8, "A Focus on Measurement: Part I", discussed concepts that are key to the successful collection and interpretation of data. Some of the topics discussed included qualitative and quantitative data, and common and special cause variation. This module takes a closer look at common and special cause variation, the sources of variation, and explores procedures to interpret variation.

Module Objectives

At the end of this module, you should be able to:

♦ Explain the difference between common cause and special cause variation

♦ Explain the purpose of a run chart

♦ Explain procedures to interpret variation

♦ Identify potential sources of variation and change

►►►Types of Variation

There are two types of variation: common cause variation and special cause variation.

◆ Common cause variation – variation that is predictable or expected within a stable situation.

    Example:

◆ Special cause variation – variation that is neither predictable nor expected. Variation that occurs as a result of a special cause can point to a possible worsening or improvement in a situation and should therefore be examined.

    Example:

Duration of Phototherapy Before and After the Improvement (Al-Naser Hospital)
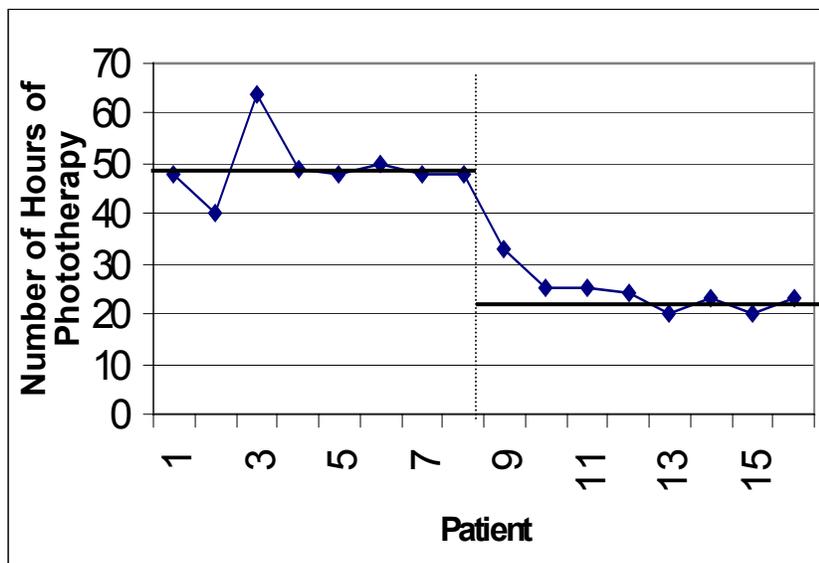
▶▶▶ Run Charts

Run charts give a picture of variation over time, and help detect special causes of that variation. They make trends or other non-random variation in the process easier to see and understand.

When to use them:

If data analysis focuses on statistics that give only a big picture (such as average, range, and variation), trends over time can often be lost. Thus, changes could be hidden from view and problems left unresolved. Run charts graphically display shifts, trends, cycles, or other non-random patterns over time. They can be used to identify problems (by showing a trend away from the desired results), and to monitor progress when solutions are carried out.

How to use them:

A run is the consecutive points running either above or below the mean. The points in a run chart mark the single events (how much occurred at a certain point in time). A run is broken once it crosses the center line. Values on the center line are ignored: they do not break the run, nor are they counted as points in the run.

Steps to create a run chart:

1. Collect data (number, time, cost) over time, recording when each measurement was taken. Arrange the data in chronological order.

2. Determine the scale for vertical axis as 1.5 times the range (the smallest value subtracted from the largest.). Label the axis with the scale and unit of measure.

3. Draw the horizontal axis and mark the measure of time (minute, hour, day, shift, week, month, year) and label the axis.

4. Plot the points and connect them with a straight line between each point. Draw the center line (the average of all the data points).

5. To use the run chart in analyzing variation, calculate and plot the mean of the data points.

Exercise: Creating a Run Chart

It has been reported to the District Health Officer of Lower Mulilinka from members of the community that health centre user fees initiated two years ago are preventing people from seeking care at the centres.

The user fees are as follows: User fees are assessed for each visit. Follow-up visits are charged the same as initial visits, and adults are charged the same as children.

The user fees have been a valuable source of income for the clinics. The income has allowed the clinics to purchase additional needed drugs, and pay staff salary and allowances that had not routinely been paid in past years. As a result, the DHO does not want to eliminate this valuable source of income for the clinics, but it also does not want the user fees to prevent patients from visiting the health clinics.

Plot the data that have been collected during the past year on the chart on a sheet of graph paper.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bombo	80	120	90	120	110	90	85	90	110	105	110	120
Coanga	150	140	130	110	120	110	120	130	120	130	115	115
Duona	120	110	120	150	130	120	140	110	100	90	110	100
Feema	260	280	240	210	220	210	230	220	210	200	210	190
Gola	200	190	230	220	190	200	190	180	170	160	150	140

Exercise: Creating a Run Chart
Directions: Use graph paper to plot the data provided in the table on the preceding page. Total the Y axis (vertical) "Number of Visits." Title the X axis (horizontal) "Months"

															Dec
															Nov
															Oct
															Sep
															Aug
															Jul
															Jun
															May
															Apr
															Mar
															Feb
															Jan
280	260	240	220	210	200	180	160	140	120	100	80	60	40	20	0

Questions for Discussion

1.   What general patterns, if any, can you identify in this data?

2.   What patterns, if any, can you see within a single health centre?

3.   Based on this data, would you agree that user fees are resulting in decreased use of the health centres? Why or why not?

►►► Interpreting Run Charts

The following guidelines can be useful in the interpretation of a run chart:

♦ Eight consecutive points above (or below) the mean suggest a shift in the process

♦ Six successive increasing (or decreasing) points suggest a trend

♦ Fourteen successive points alternating up and down suggest a cyclical process

►►► Sources of Variation and Change

There are six main sources of variation and change. They are: people, materials, measurements, machines, methods, and environment.

Source   **Example**

♦ People _____

♦ Materials _____

♦ Measurements _____

♦ Machines _____

♦ Methods _____

♦ Environment _____

MODULE 16: QI SUCCESS STORIES: A FINAL LOOK

Module Introduction

At the beginning of this course, you were introduced to quality improvement by reading and discussing how it is being practiced at four different facilities. Now that you've learned about the quality improvement problem solving methodology and the four principles of quality assurance, this module provided you with the opportunity to revisit and reconsider the cases to determine what made each initiative successful.

Module Objectives

At the end of this module, you should be able to:

◆ Analytically review quality improvement success stories to identify aspects of them that were critical to their success

◆ Begin to assess your own facility for factors that will help you be successful in your QI endeavor

▶▶▶ Quality Improvement Success Factors / Success Story 1

Directions: Use the space provided below to write down ideas generated during class discussion.

▶▶▶Quality Improvement Success Factors / Success Story 2

Directions: Use the space provided below to write down ideas generated during class discussion.

▶ ▶ ▶ **Quality Improvement Success Factors / Success Story 3**

Directions: Use the space provided below to write down ideas generated during class discussion.

▶▶▶ Quality Improvement Success Factors / Success Story 4

Directions: Use the space provided below to write down ideas generated during class discussion.

►►►Quality Improvement Success Factors / Factors Visible in All Success Stories

Directions: Use the space provided below to write down ideas generated during class discussion.

MODULE 17: TEAM ENERGIZERS

Module Introduction

This module provides several energizers that can be used to energize a class or a team meeting. They are to be used at the discretion of the instructor at various times during the course when he or she identifies the need for a break. You are encouraged to use them in your own setting when your team needs energizing. The instructor has additional information about these energizers that he or she will give you at the end of the program.

Module Objectives

These energizers will help you:

◆ Relax during a needed break

◆ Challenge your problem solving abilities

◆ Be creative

◆ Learn about your classmates

◆ Enjoy a change of pace

►►► Changing Times[1]

The equation below is incorrect. Interchange two digits to make it correct.

$$
\begin{array}{r}
3\ 2\ 4 \\
\times\quad 6\ 8 \\
\hline
2\ 9\ 9\ 2 \\
2\ 7\ 4\ 4 \\
\hline
2\ 5\ 4\ 3\ 2
\end{array}
$$

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[1] Reproduced from BRAIN TWISTERS FROM THE FIRST WORLD PUZZLE CHAMPIONSHIPS. Will Shortz, Editor. New York: Random House, Inc., 1993.

►►► 13 Squares[2]

Begin in any square in the grid and travel horizontally and vertically (never diagonally) from square to square through 13 connected squares. The 13 squares contain different numbers that total 100 exactly. What 13 connected squares total 100?

10	5	15	8	2
4	13	10	1	4
3	9	6	3	7
14	7	5	9	12
1	13	6	15	2

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[2] Reproduced from BRAIN TWISTERS FROM THE FIRST WORLD PUZZLE CHAMPIONSHIPS. Will Shortz, Editor. New York: Random House, Inc., 1993. (Originally published as *Travels with My Ant*)

►►► Lucky Seven[3]

Put each of the numbers 1 thru 9 into the boxes in order to make the equation correct.

$$\frac{\square\ \square}{\square\ \square\ \square} + \frac{\square\ \square}{\square\ \square} = 7$$

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[3] Reproduced from BRAIN TWISTERS FROM THE FIRST WORLD PUZZLE CHAMPIONSHIPS. Will Shortz, Editor. New York: Random House, Inc., 1993.

►►► Olympic Rings[4]

Place each of the numbers 1 thru 12 in the squares, one number per square, so that the sum of each circle is 28. Four numbers have been placed already.

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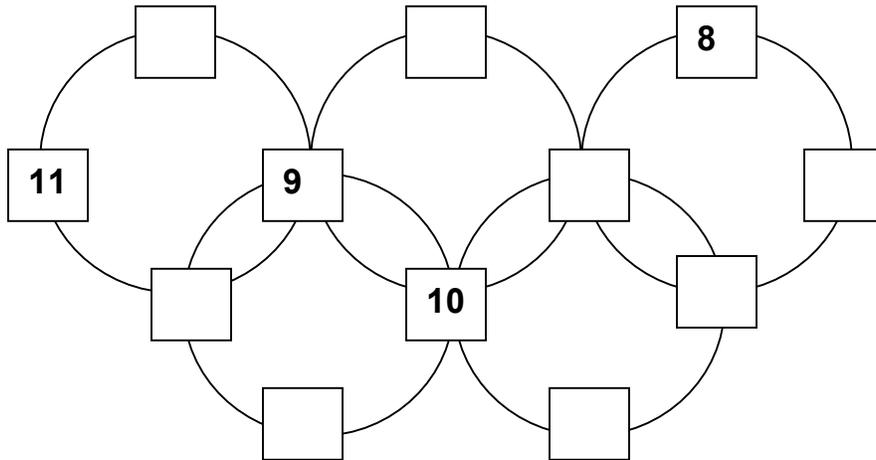
[4] Reproduced from BRAIN TWISTERS FROM THE FIRST WORLD PUZZLE CHAMPIONSHIPS. Will Shortz, Editor. New York: Random House, Inc., 1993.

▶▶▶ **Quality Improvement Word Search**

```
Q  U  D  I  M  E  N  S  I  O  N  S
A  U  T  R  S  I  N  A  P  W  M  V
B  R  A  I  N  S  T  O  R  M  E  U
T  R  Q  L  D  P  O  M  Z  W  A  E
R  B  P  R  I  N  C  P  L  E  S  S
A  B  D  L  R  T  I  R  T  D  U  T
C  C  S  A  R  C  Y  O  H  T  R  Y
E  L  A  R  T  Y  V  C  A  R  E  M
A  I  R  J  O  L  E  E  D  S  M  A
S  E  A  T  O  O  L  S  A  A  E  N
E  N  K  R  M  B  U  S  T  G  N  I
T  T  E  A  M  W  O  R  K  N  T  W
```

Search the grid of letters for the following quality improvement words:

Brainstorm	PDSA
Client	Principles
Dimensions	Process
Measurement	Teamwork
Quality	Tools

▶▶▶ **Quality Improvement Tools Word Search**

```
S  T  A  N  A  L  Y  S  I  S  T  A
G  B  E  A  D  Y  P  B  C  T  W  F
F  A  N  V  D  T  W  F  R  O  R  F
T  A  N  N  E  S  F  L  O  R  N  I
J  O  H  T  N  S  H  O  P  Y  U  N
P  A  R  E  T  O  T  W  H  T  A  I
T  O  M  B  O  N  D  C  A  E  N  T
A  P  M  I  N  S  Y  H  S  L  T  Y
P  I  T  B  D  L  A  A  P  L  D  F
B  E  N  C  H  M  A  R  K  I  N  G
A  D  I  A  G  R  A  T  N  N  S  M
R  G  O  R  V  O  T  I  N  G  V  P
```

Search the grid of letters for the following quality improvement tools:

Pareto	Affinity
Pie	Voting
Benchmarking	Bar
Gantt	Flowchart
Analysis	Storytelling

►►► Hidden Squares[5]

Count the number of squares in the visual below.
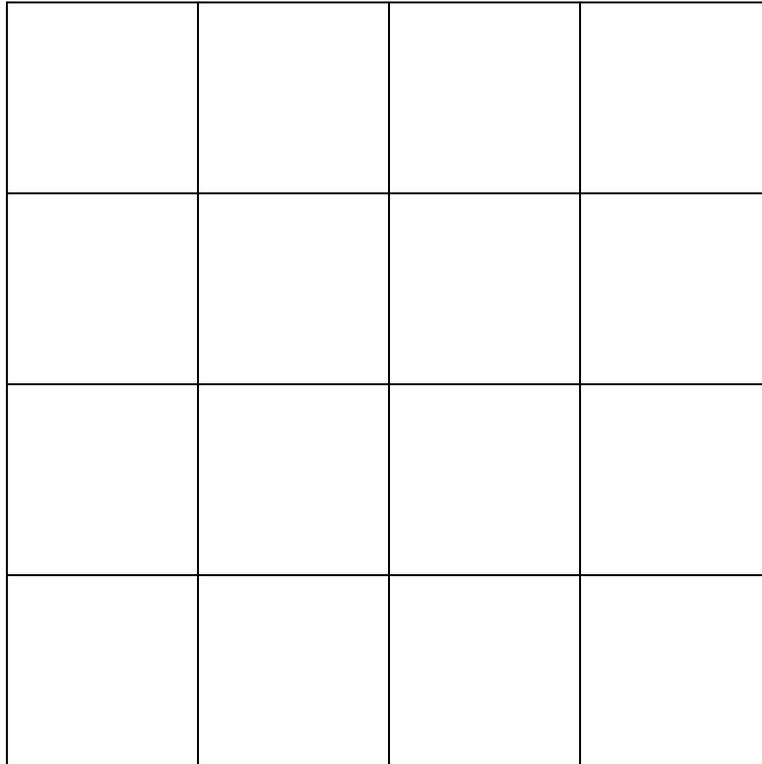
[5] Reproduced from THE BIG BOOK OF TEAM BUILDING GAMES. John Newstrom and Edward Scannell. New York: McGraw Hill, 1998.

▶▶▶ Can you guess?[6]

Write down something about yourself (a secret) that no one else in the group knows on the sheet of paper you are provided. Then, follow the instructions provided by the facilitator to play this game.

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[6] Adapted from WARMUPS FOR MEETING LEADERS. Sue Bianchi, Jan Butler, and David Richey. San Diego, California: University Associates, 1990.

► ► ► A Poem, A Skit, and A Song[7]

In groups of 3 or 4 people, either write a poem, a skit, or a song about a topic you discussed this morning. You will be asked to present the work of your team.

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[7] Reproduced from WARMUPS FOR MEETING LEADERS. Sue Bianchi, Jan Butler, and David Richey. San Diego, California: University Associates, 1990.

►►► Clear Instructions[8]

When asked, draw the diagram as the volunteer describes it. You are not allowed to ask any questions. Then, compare you drawings to the diagram described by the volunteer.

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[8] Adapted from WARMUPS FOR MEETING LEADERS. Sue Bianchi, Jan Butler, and David Richey. San Diego, California: University Associates, 1990

MODULE 18: UNDERSTANDING THE QI ENVIRONMENT

Module Introduction

Before you can begin to plan a quality improvement initiative, it's important to understand the environment in which you will be working. This module introduces four different techniques that can be used to help you better understand your environment—the clients diagram, the silent members seating chart, force field analysis, and a SWOT analysis.

Module Objectives

At the end of this module, you should be able to:

◆ Identify potential QI initiatives that are relevant to your healthcare facility

◆ Recognize the value of understanding the environment within which the QI effort will be initiated

◆ Explain various techniques that can be used to help understand the QI environment

◆ Use one or more tools presented in the module to better understand the environment in which the QI initiative will be situated

▶▶▶ Clients Diagram

Various clients will have an interest or stake in the improvement initiative you and your colleagues undertake. Depending on the nature of the improvement initiative, clients that are interested may include patients, patients' families, suppliers and vendors, facility administrators, healthcare workers, and members of the community.   One way to bring your various clients into focus is by creating a clients diagram.
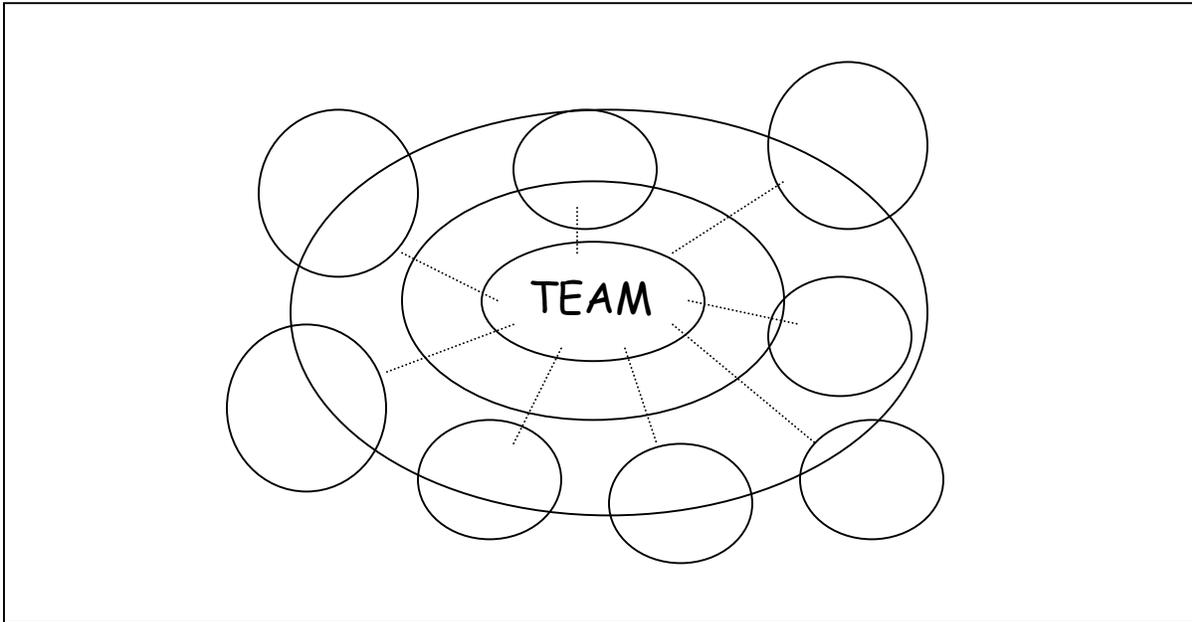
Steps to create a clients diagram:

1. Emphasize to the team the value of being aware of those that have an interest in the quality improvement initiative.

2. Brainstorm a list of clients.

3. Hang up a large sheet of paper and place the team in the center.

4. Draw several concentric rings around the team to identify the systems within which your team resides.

5. Draw other rings that identify the names of people or specific groups with whom the team has a relationship. Mark the names of the individuals or groups in the rings and the specific interest they have in the initiative.

6. Refer to the clients map when making decisions, and update it to remain current.

▶ ▶ ▶ Silent Members Seating Chart

In addition to identifying individuals and groups that have a stake in the quality improvement initiative, it is also important to identify silent team members. Silent team members are individuals that don't actually sit on a team, but follow the team's progress. They will likely include the manager or supervisor of team members, an administrator who is providing resources for the project, and other managers in the organization.
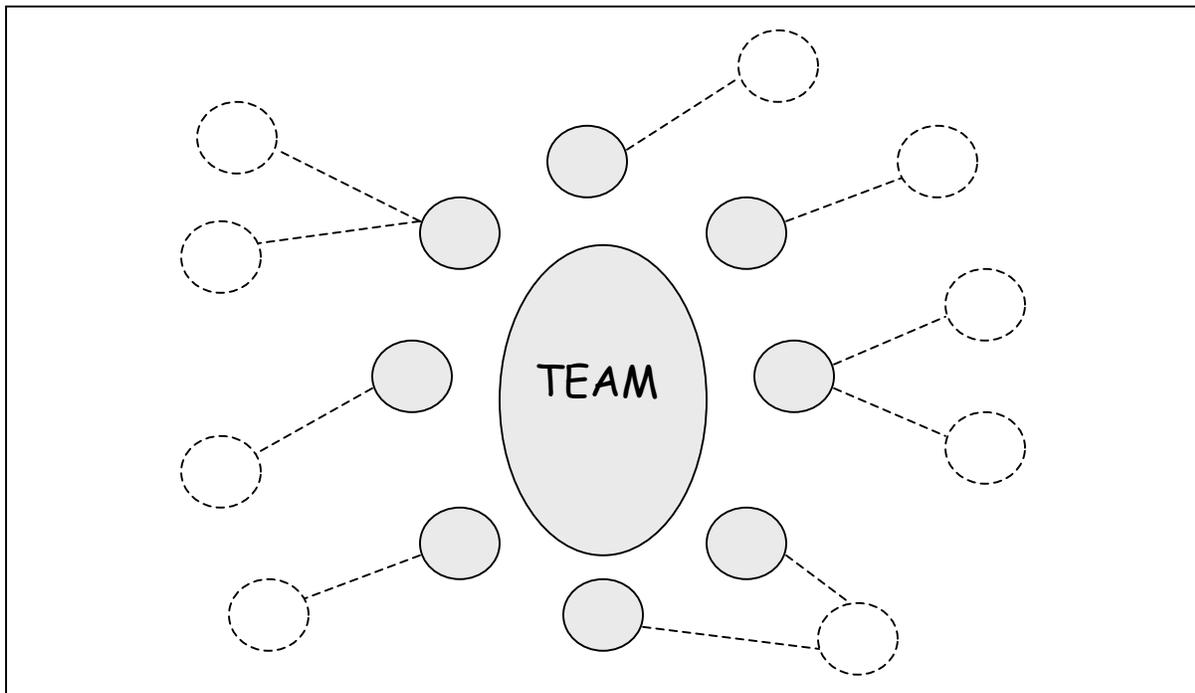

Steps to identify silent members:

1. Draw a seating chart of the team.
2. Ask each team member to identify the person or persons to whom they report and who will be following the team's progress.
3. Draw the silent members around the outside of the seating chart and draw lines that identify the link between the silent member and the team member
4. Determine what impact the silent team members may have on the team.
5. Brainstorm what actions the team or individual team members might want to take to manage the relationship with the silent members.

▶ ▶ ▶ Force Field Analysis

Force Field Analysis is a tool that is useful for identifying factors in an environment that might support change as well as those that might resist it. Kurt Lewin, a founder of the field organizational development, developed it. It is especially helpful in exploring more subjective issues such as management effectiveness, staff morale, and work climate.
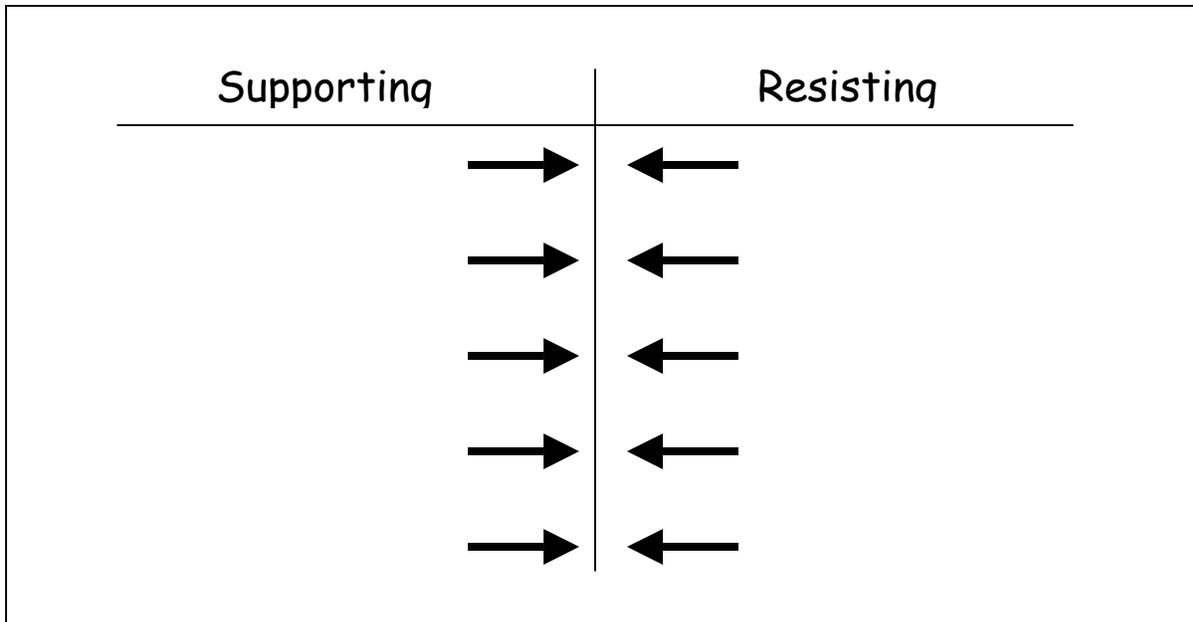
Steps to conduct a Force Field Analysis:

1. Hang a large sheet of paper on the wall and draw a 'T' on it.

2. Identify with your team the focus of your analysis.

3. List on the left side of the 'T' all the forces that will support the change.

4. List on the right side of the 'T' all the forces that will resist the change.

5. Review and clarify each force and try to understand why it exists. Rate its relative impact on your initiative (high, medium, or low).

6. Brainstorm strategies for minimizing the impact the resisting forces and maximizing the impact of the supporting forces.

►►► SWOT Analysis

A SWOT Analysis is another useful tool that can be used to help the team understand the quality improvement environment. The acronym SWOT stands for *strengths*, *weaknesses*, *opportunities*, and *threats*. Often, the strengths, weakness, opportunities, and threats are interrelated, as shown in the example provided. This is as it should be, as it helps identify what actions might need to be taken to achieve success. In this example, what might be done to help ensure other staff members would have the time for training?

Strengths	Opportunities
– Staff is committed to improving quality	– We can share what we've learned with staff members and ask for help from an expert
Weaknesses	**Threats**
– Very few staff members understand quality improvement concepts	– Other staff might not have the time to attend training.

Steps to conduct a SWOT Analysis:

1. Hang a large sheet of poster paper on the wall or four sheets of flipchart paper.

2. Label each quadrant as strengths, weaknesses, opportunities, or threats as shown above.

3. Brainstorm and list all of the strengths of your team and environment.

4. Brainstorm and list all of the weaknesses of your team and environment.

5. Determine how you can turn weaknesses into opportunities and list the opportunities generated.

6. Identify possible threats to the team and the quality improvement initiative. These are factors that could terminate the initiative or the team. Determine how you can address these threats and minimize their impact on your work.

►►► Known Change Strategies

The list of known change strategies provided below classifies and groups past quality improvement efforts. These improvement efforts have not been limited to healthcare.

Known Change Strategies

Eliminate waste
- Eliminate things that are not used
- Eliminate multiple entry
- Reduce or eliminate overkill
- Reduce controls on the system
- Change targets or set points
- Recycle or reuse
- Use substitution
- Reduce classifications
- Remove intermediaries
- Match the amount to the need
- Using sampling

Synchronize
- Schedule into multiple processes
- Minimize handoffs
- Move process steps closer together
- Find and remove bottlenecks
- Automate
- Smooth work flow
- Do tasks in parallel
- Adjust to peak demand

Optimize inventory
- Match inventory to predicted demand
- Reduce multiple brands of same items
- Reduce choice of features

Manage variation
- Standardize / create formal process
- Develop operational definitions
- Improve predictions
- Develop contingency plans

Design systems to avoid mistakes
- Use reminders
- Use differentiation
- Install preventative measures
- Use checks and balances
- Use grants of authority

Change the environment
- Give people access to information
- Use proper measurements
- Take care of basics
- Reduce de-motivating aspects of pay system
- Provide training
- Implement cross training
- Invest more resources in improvement
- Focus on core processes and purpose
- Share risks
- Develop alliances and cooperative relationships

Enhance product / Customer relationship
- Listen to customers
- Coach customers to use product / service
- Focus on the outcome to a customer
- Use a coordinator
- Reach agreement on expectations
- Work with suppliers
- Optimize level of inspection

Manage time
- Reduce setup or startup time
- Set up timing to use
- Optimize maintenance
- Extend specialists time
- Reduce wait time

Focus on the product or service
- Mass customize
- Offer product / service anytime
- Offer produce / service anyplace
- Emphasize intangibles
- Influence or take advantage of trends
- Reduce the number of components
- Differential product / service using quality dimensions

►►► **Understanding the QI Environment**

Directions: Use this space to practice using the various tools presented in this module.

►►► Understanding the QI Environment
Directions: Use this space to practice using the various tools presented in this module.

► ► ► **Understanding the QI Environment**
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▶▶▶ Understanding the QI Environment

Directions: Use this space to practice using the various tools presented in this module.