

**Performance Improvement Model
(DMAIC)**



Performance Improvement Training Session Four

Analyze Step



Kim Erlandson, RN, MPH, CPHQ

Quality Management Coordinator

University of Iowa Hospitals & Clinics

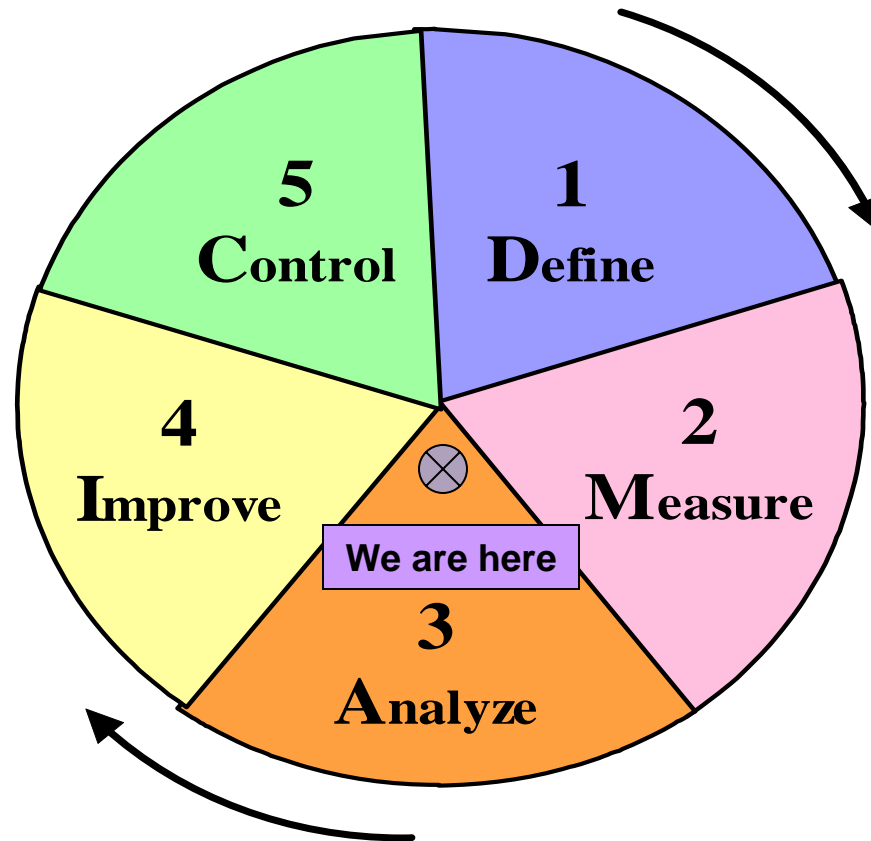
December 1, 2005

Today's Objectives

- Be able to develop a more focused problem statement
- Be able to identify root causes of the problem using key tools
- Understand importance of verifying root causes with data
- Practice using tools

Review

Performance Improvement Model (DMAIC)



Define

Goal

- ❑ Define the project's purpose and scope and get background on the process and customer

Output

- ❑ Clear statement of the intended improvement and how it will be measured.
 - Tool: Charter
- ❑ A high-level map of the process
 - Tool: SIPOC analysis (Suppliers Inputs Process Outputs Customers)
- ❑ Translation of the Voice Of the Customer (VOC) into Critical To Quality (CTQ)

Measure

Goal

- Focus the improvement effort by gathering information on the current situation.

Output

- Data that pinpoints problem location or occurrence
- Baseline data
- Understanding of how current process operates
- A more focused problem statement

Analyze

Goal

- Identify root causes and confirm them with data

Output

- A theory that has been tested and confirmed with data

Simply stated:
“The most important factors that are driving results of the process”

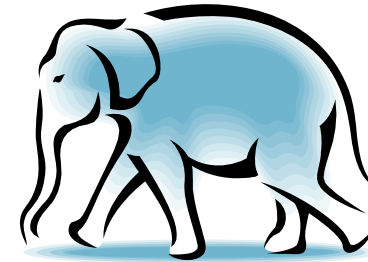
Analyze

❑ Focused Problem Statement

- May not be the same as the initial problem statement developed in the Define Phase
 - You likely have more information/data now

❑ Why do Another Problem Statement?

- Makes problem manageable
 - Don't tackle the elephant
- Keeps people engaged
- More efficient use of time and resources



Focused Problem Statement

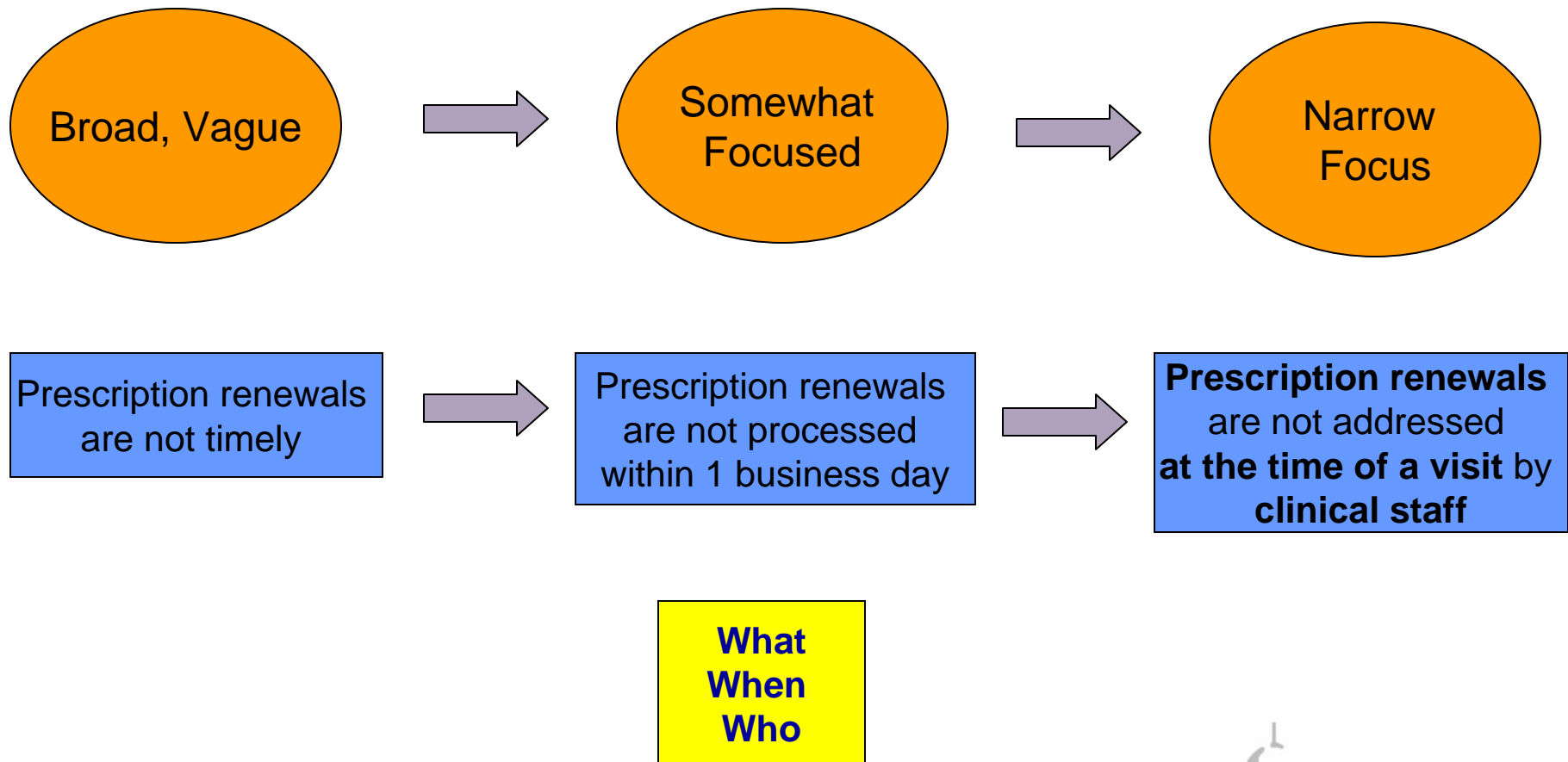
Focused Problem Statement
Describes **Specifically**:

What Occurs

When or under what
circumstances it occurs

Who is involved

Focused Problem Statement



Analyze

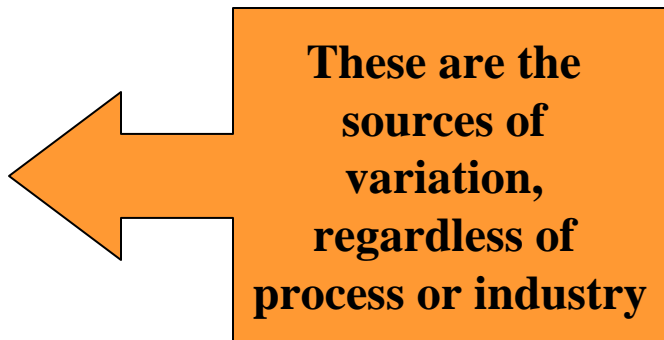
Tools

- Cause and Effect Diagram
- 5-Whys
- Might-Cause Check

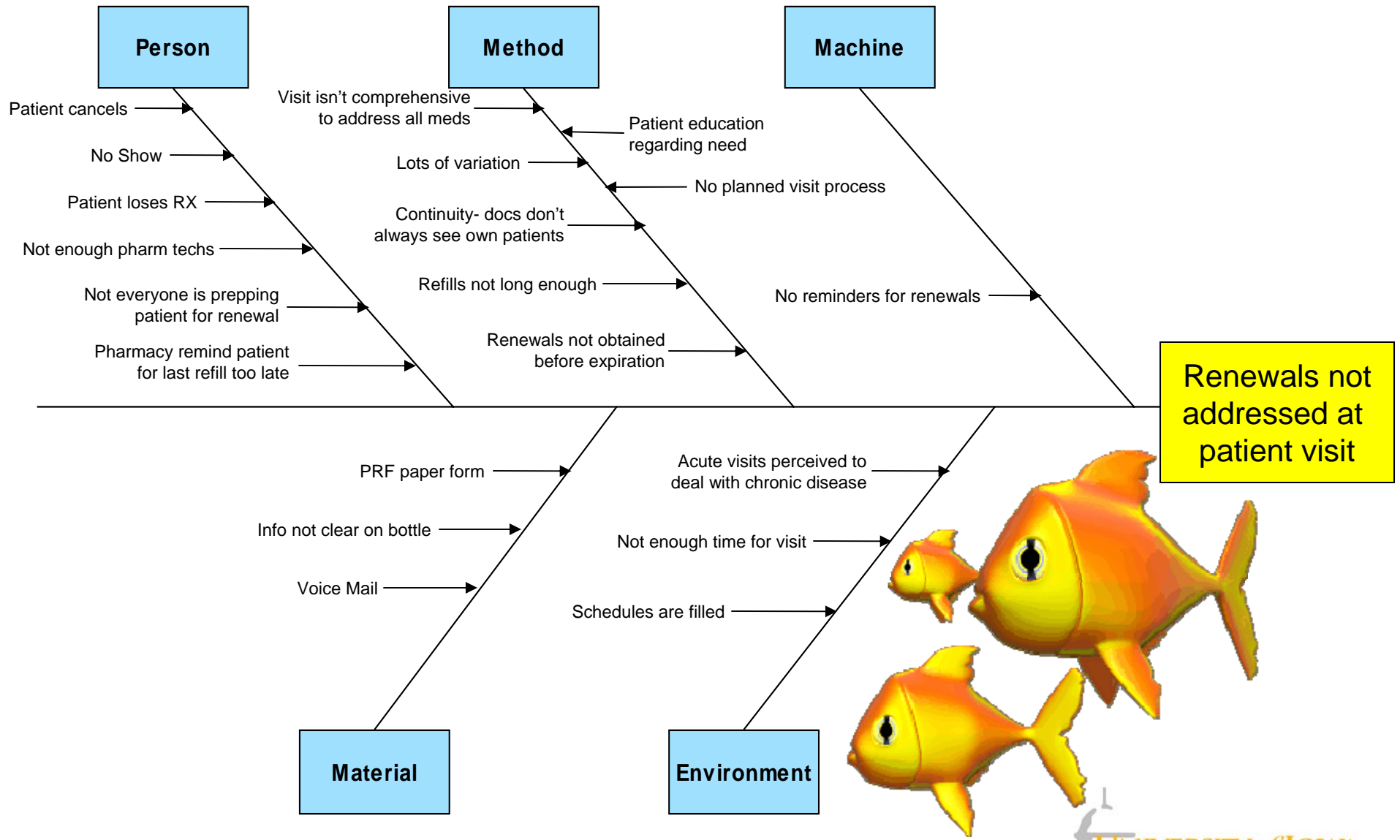
Analyze

Cause and Effect Diagram (Fishbone)

- ❑ Identify, explore and graphically show all possible causes
- ❑ Uses 5 inputs of every process
 - Person
 - Machine
 - Method
 - Material
 - Environment



Cause & Effect (Fishbone) Diagram



Cause & Effect Diagram

- ❑ Common Mistakes when using Cause & Effect Diagram
 - Do not use as an outline or flowchart
 - Do not use to list solutions

Analyze

5 – Whys

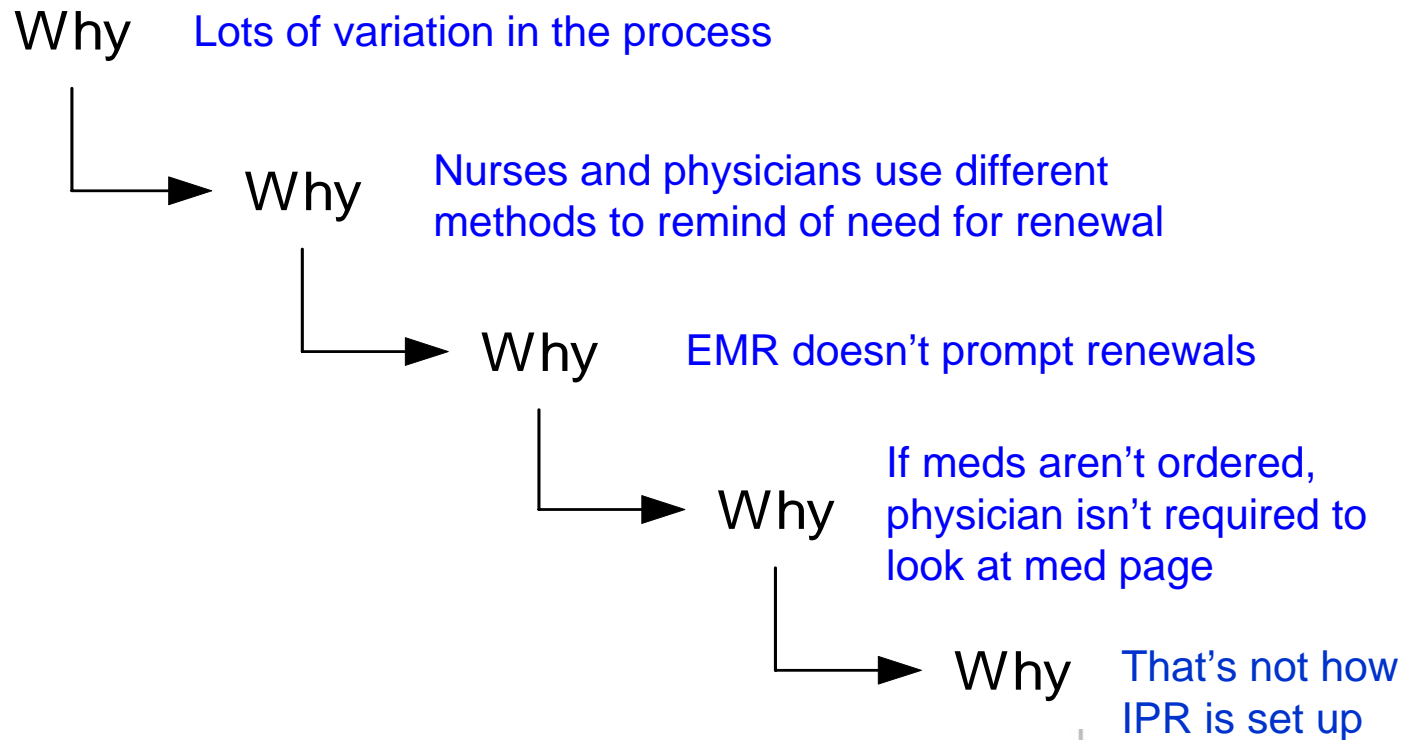
- Used to determine root cause of problem
- Use while completing Cause & Effect Diagram
- Encourages “mile-deep” thinking



Analyze

Focused Problem
Statement: Renewals
not addressed at time
of patient visit

5-Whys



Analyze



Might-Cause Check

- Helps confirm that items listed on Cause & Effect Diagram are potential causes
- Helps to check relationships between items
- Helps to make sure items are arranged in a logical sequence

Might-Cause Check

Clinicians aren't required to look at medication page in EMR, which shows renewal dates

Smallest branch

Might cause

Ineffective/inefficient use of EMR

Next largest branch

Which might cause

Clinicians use different methods to remind of need for renewal

Next largest branch

Which might cause

Lots of variation in the process

Next largest branch

Which might cause

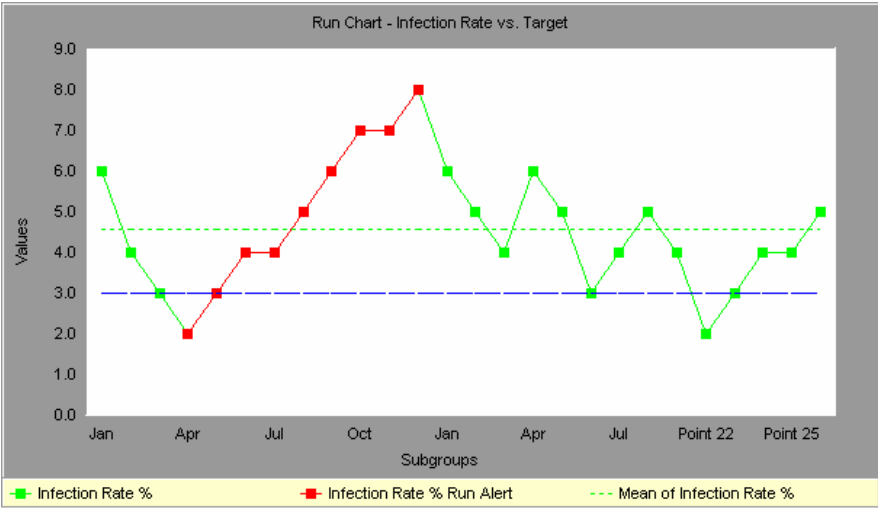
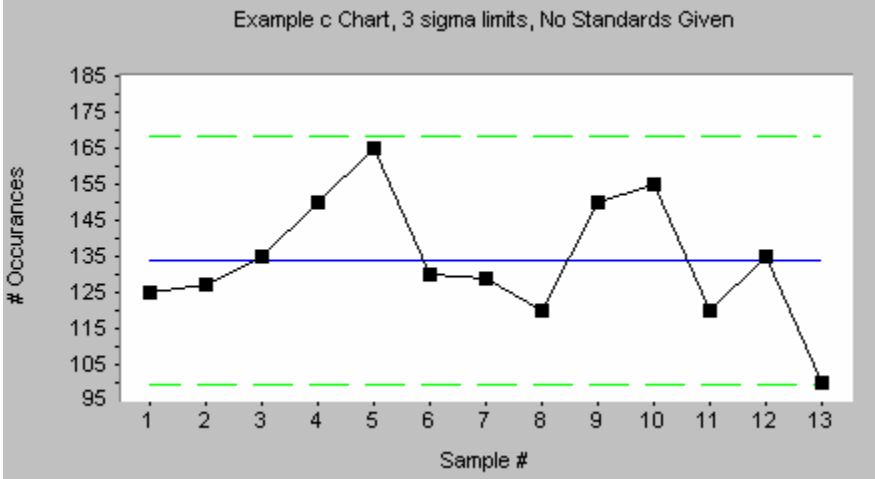
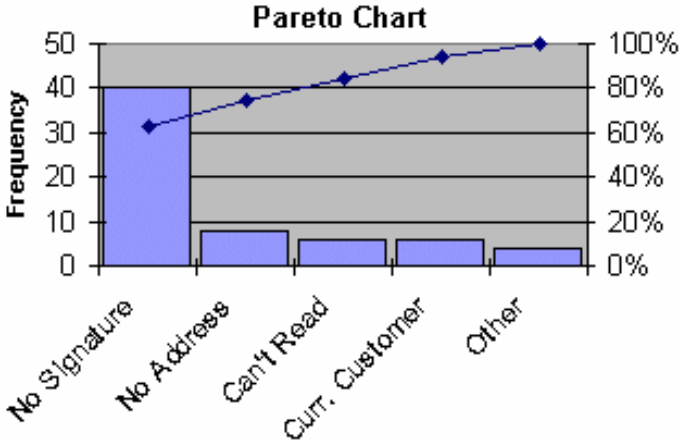
Renewals not obtained at patient visit

Problem statement/Effect

Verify Root Causes

- You **MUST** Verify Root Causes with data to confirm they are real causes
- Multi-vote if multiple likely root causes and no consensus
- Verify data only on most likely root causes
- Consider data collection if you haven't already collected these data during the Measure Phase

Tools to Verify Root Causes



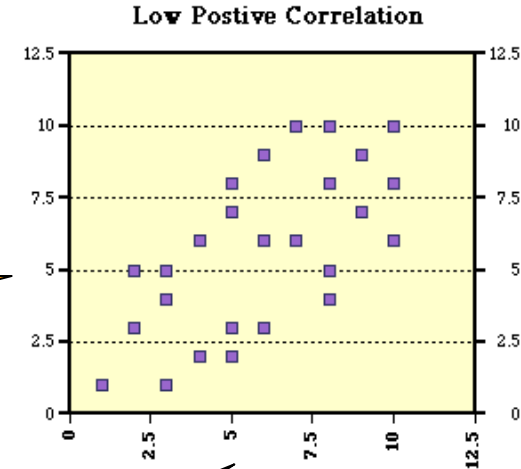
Scatter Plot

Visualize relationships between two variables

- ❑ Generally need many data points
- ❑ X and Y axis are same length
- ❑ Correlation is not causation

Effect is on
vertical axis

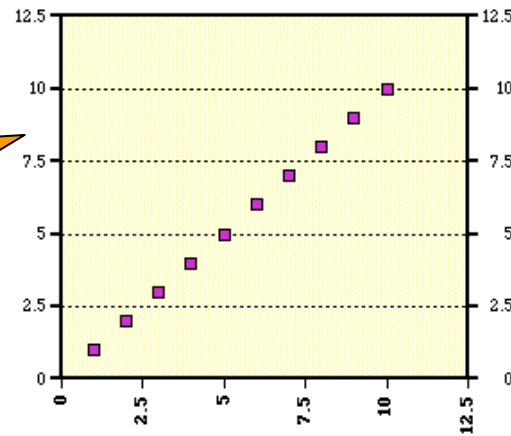
Cause is on
horizontal axis



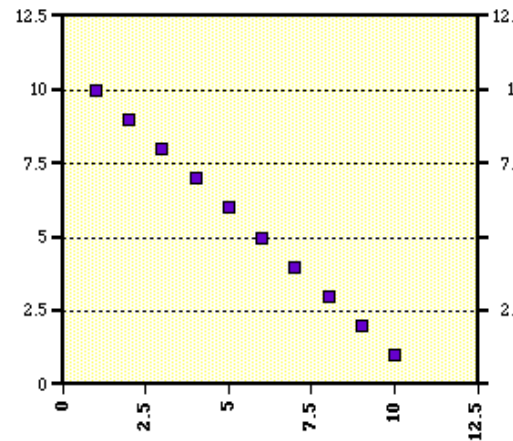
Scatter Plot

Every time 'x' number of people go, 'y' amount of money is spent.

Perfect Positive Correlation



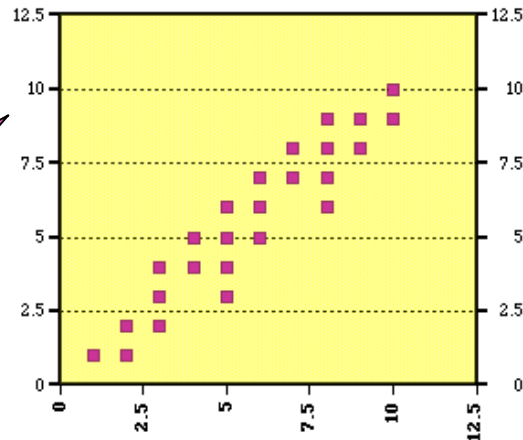
Perfect Negative Correlation



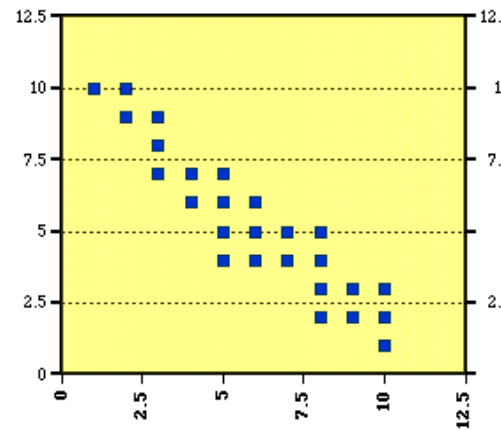
As speed increases, amount of time to destination decreases.

Hours spent studying for an exam versus grade received.

High Positive Correlation



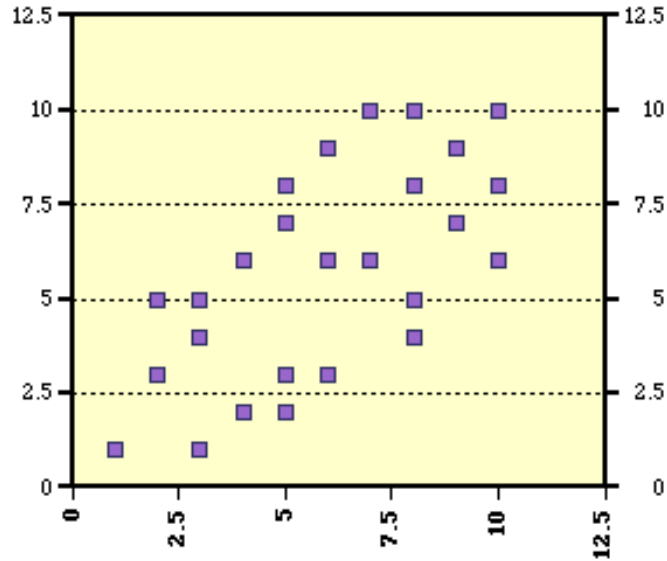
High Negative Correlation



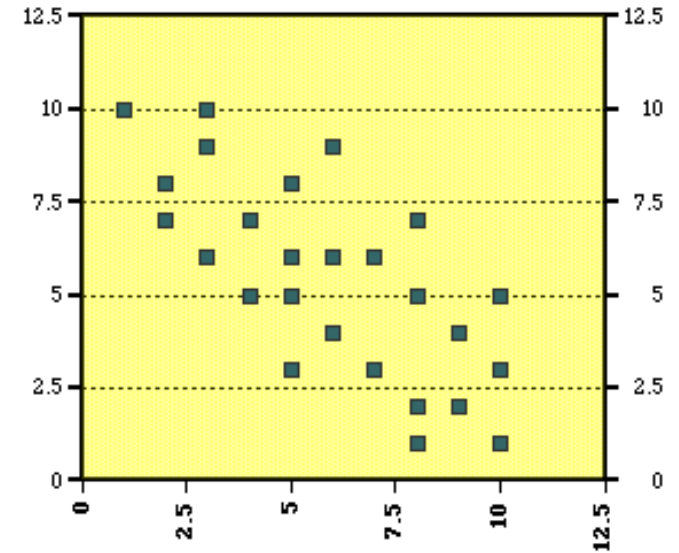
As the # of flu vaccines increases, the # of flu cases decreases.

Scatter Plot

Low Positive Correlation

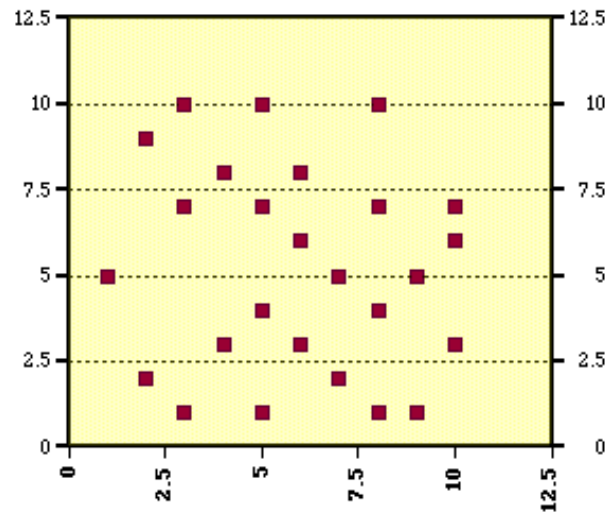


Low Negative Correlation



Dots clustered and show a trend

No Correlation



Verify Root Causes

- ❑ How would you verify this with data?
 - “Clinicians aren’t required to look at medication page in EMR, which shows renewal dates”

- ❑ Possible Data Sources:
 - Survey clinicians
 - Determine if there is an EMR (Electronic Medical Record) report that can be run

Completion Checklist

- ❑ Have data that verifies which potential causes actually contribute to the problem.
- ❑ Describe to your sponsor the causes on which you will focus in the **IMPROVE** Phase by discussing the following:
 - Potential causes you identified
 - Potential causes you chose to investigate and reasons for your choice(s)
 - Types and results of data collected to verify the causes

Questions?

❑ CORM Website

➤ <http://www.uihealthcare.com/depts/corm/index.htm>

❑ CORM Main Number 356-4311

➤ My Number 353-7222