Pareto Diagram

According to the "Pareto Principle," in any group of things that contribute to a common effect, a relatively few contributors account for the majority of the effect. A Pareto diagram is a type of bar chart in which the various factors that contribute to an overall effect are arranged in order according to the magnitude of their effect. This ordering helps identify the "vital few" (the factors that warrant the most attention) from the "useful many" (factors that, while useful to know about, have a relatively smaller effect). Using a Pareto diagram helps a team concentrate its efforts on the factors that have the greatest impact. It also helps a team communicate the rationale for focusing on certain areas.

This tool contains:

- Directions
- Sample Pareto Data Table and Diagram: Errors During Surgical Setup

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Directions

1. Collect data about the contributing factors to a particular effect (for example, the types of errors discovered during surgical setup).

2. Order the categories according to magnitude of effect (for example, frequency of error). If there are many insignificant categories, they may be grouped together into one category labeled "other."

3. Write the magnitude of contribution (for example, frequency of error) next to each category and determine the grand total. Calculate the percentage of the total that each category represents.

4. Working from the largest category to the smallest, calculate the cumulative percentage for each category with all of the previous categories.

5. Draw and label the left vertical axis with the unit of comparison (for example, "Number of Occurrences of Error," from 0 to the grand total).

6. Draw and label the horizontal axis with the categories (for example, "Type of Error"), largest to smallest from left to right.

7. Draw and label the right vertical axis "Cumulative Percentage," from 0 to 100 percent, with the 100 percent value at the same height as the grand total mark on the left vertical axis.

8. Draw a line graph of the cumulative percentage, beginning with the lower left corner of the largest category (the "0" point).

9. Analyze the diagram to indicate the cumulative percentage associated with the "vital few" (for example, three error types account for 80 percent of all errors).

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Sample Pareto: Errors During Surgical Setup

One team used Pareto analysis to identify the "vital few" factors that contributed to errors during surgical setup. The team identified eight types of surgical setup errors, and collected data on the frequency of each type (see table). When the team displayed this data in a Pareto diagram, they discovered that three types of errors accounted for 80 percent of all errors. Instead of working on all error types, the team focused its efforts on these three "vital few" error types.

Sample Data Table: Types of Errors Discovered During Surgical Setup

Error Type	Frequency	Percent	Cumulative %
Wrong Supplier	67	46.5	46.5
Excess Count	24	16.7	63.2
Too Few Count	17	11.8	75
Wrong Size	10	6.9	81.9
Wrong Sterile Instrument Set	10	6.9	88.8
Missing Item	8	5.6	94.4
Damaged Item	6	4.2	98.6
Other	2	1.4	100
TOTAL	**144**	**100**	

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Sample Pareto Diagram: Types of Errors Discovered During Surgical Setup