

Measuring Success



Overview

This section is designed to help when measuring the success of your program or an intervention. This section will cover:

- I. Steps in Measuring Success
- II. Key Measures
- III. Other Important Measures
- IV. Analyzing the Data

A Word about Benchmarking:

Many people are interested in benchmarking fall rates. Although leadership and regulatory agencies may focus on fall rates and attempt to establish benchmarks, it is important not to lose sight of our goal: to promote independence while preventing fall-related injury. Benchmarks often focus on fall rates and lose focus on injury rates. We recommend benchmarking against your own baseline, setting stretch goals for reduction of falls and reducing severity of fall-related injuries, then monitoring achievement. We also recommend finer analysis of fall rates by type of fall, which is discussed in *IV. Analyzing the Data*. It is also important when benchmarking to use comparable populations, for example, long term care or acute care, otherwise your comparisons may not be as relevant.

I. Steps in Measuring Success

There are 4 steps to measuring the success of your program:

A. Step 1: Define the scope

The first step in measuring the success of your program is to define what you are reviewing. For falls, you will need to develop a definition of a fall. The suggested definition of a fall is a sudden, uncontrolled, unintentional downward displacement of the body to the ground or other object, excluding falls resulting from violent blows or other purposeful actions.

When defining a fall, it is important to consider:

1. *Unwitnessed falls (specify that you looked at this type of fall when sharing data with staff and leadership)*
2. *Types of “near falls” or “near misses,” such as trips or slips*

You should also define and measure the severity of injuries due to falls. The VHA standards for injury severity are as follows:

0 = None *no injury or disability*²

1 = Minor Injury (abrasion, bruise, minor laceration).¹ *Injuries are minor in nature, and if they do require any medical intervention, they do not extend the patient’s hospital stay except for observation or to obtain laboratory and/or radiology results.*²

2 = Major Injury (hip fracture, head trauma, arm fracture)¹ *Injuries which require medical or surgical intervention, increased hospital stay, or are disabling and/or disfiguring to a degree that the patient will have any degree of permanent lessened function or require surgical repair.*²

3 = Death^{1,2}

NOTE:

The Severity Index is not intended to replace the use of the Safety Assessment Code (SAC) Matrix in determining the need for a Root Cause Analysis. For more information please contact your Patient Safety Manager.

B. Step 2: Deciding what to measure and how

The three different types of measurements are **outcome**, **process** and **balancing measures**.

Outcome measures help determine if the desired patient goal is being achieved. For example are we reducing falls and injuries due to falls? You could also examine organizational goals such as “reduce severity of fall related injury by 20%...”

Process measures tell us if we are implementing actions that are expected to lead to improvement. For example, you may want to examine how many patients are assessed for fall risk or the percentage of patients who fell and had all the indicated interventions in place. If you find a high percentage of patients who fell did not have all of the indicated interventions implemented you may want to focus on improving the use of fall prevention interventions. Another process measure is the percentage of staff trained in fall prevention.

Balancing measures are factors to monitor while you are improving one area to ensure that another area of care has not gotten worse. For example, we recommend measuring restraint use to ensure it does not go up as you try to reduce your fall rates.

For examples of each of these measures see the next part.

The measures you use should follow these simple rules:

1. *Contains a numerator and denominator*
2. *Specifies the time in which the information will be collected, i.e., monthly, quarterly or annually*
3. *Specifies the measurement strategy, i.e., observation, random checks of patient charts or number of incident reports (Keep in mind that if you measure incident reports you're not measuring the actual number of incidents, but the level of reporting — this may skew your results.)*

C. Step 3: Collect baseline data

Once you have chosen your specific measures, such as fall rates, major injury rates and restraint use, you will need to collect some baseline data. The baseline data is taken **prior** to the implementation of the program or a specific intervention. It is used to determine whether there is a change in your measures after the intervention is implemented.

Keep in mind that you will need at least five or six baseline data points in order to ensure accurate data.

D. Step 4: Collection and analysis of data after implementation

After implementing the program or specific intervention you will need to keep measuring the data. You will need five or six data points after the implementation is complete to ensure accurate information. For more information on data analysis please see the data analysis section.

II. Key Measures

The measures that are most often used are **Fall Rate** and **Major Injury Rate**. This information is often easiest to show in a run chart. This will be described in the section on data analysis.

A. Fall Rate

The fall rate is a measurement of risk. It tells you how many falls you can expect for every 1000 bed days of care (BDOC).

Fall rate = (number of falls/bed days of care) x 1000 BDOC

Note: Bed days of care tells how many days patients were in beds. For example, if you have a census of 30 for 30 days this is 900 BDOC. To obtain the bed days of care for your unit or facility you should contact the health information department.

Example of Fall Rate:*

Your facility has had 4 falls in the last month. The health information department reports that you had 900 bed days of care last month. Thus your **fall rate** for last month was:

Fall Rate = (Number of Falls/Bed Days of Care) x 1000BDOC = (4/900) x 1000 = 4.44 per 1000 BDOC

Interpretation:

For every 1000 bed days of care you can expect to have about 4 falls.

B. Injury Rates

Injury rate = (number of injuries/number of falls) x 100

The injury rate tells you how many injuries per 100 falls. It is important to separate the injuries based on their severity, using the severity index described in the previous section. Depending on the intervention you are implementing you may want to measure both the major and minor injury rates. For instance if you were implementing hip protectors you would want to see a decrease in the major injury rate but you may see an increase in the minor injury rate as a result.

Example of Injury Rates:*

Your facility has had 80 falls in the last month. Of the 80 falls, 5 falls resulted in a minor injury, 3 falls resulted in a major injury, such as a hip fracture, and the remainder resulted in no injury.

Minor Injury Rate = (5/80) x 100 = 6.25 per 100 falls (6.25%)

Major Injury Rate = (3/80) x 100 = 3.75 per 100 falls (3.75%)

Interpretation:

6.25% of the falls last month resulted in minor injuries and 3.75% resulted in major injuries.

III. Other Important Measures

When aggregating fall data look for trends such as falls related to toileting or repeat fallers. This can lead to focusing on reducing particular types of falls. To do this you may want to keep track of:

1. *Where a fall occurred (e.g., a specific unit or a place like a bathroom or hallway).*
2. *What the patient was doing, or attempting to do, at the time of the fall.*
3. *The shift that the fall occurred on (e.g., first, second or third shift).*

This information is categorical and the easiest way to analyze it is by using a Pareto chart or bar graph.

To aid aggregate review teams and target future interventions you should keep track of factors that related to each fall, such as communication issues, assistive devices and environmental factors. For more information on this and other ways to measure success, please see the CD-ROM or Web site.

IV. Analyzing the Data

Once you have collected the data you will need to analyze it. There are two easy ways to look at your data: **run charts** or **Pareto charts**. For other ways to analyze the data, please see the Web site or CD-ROM.

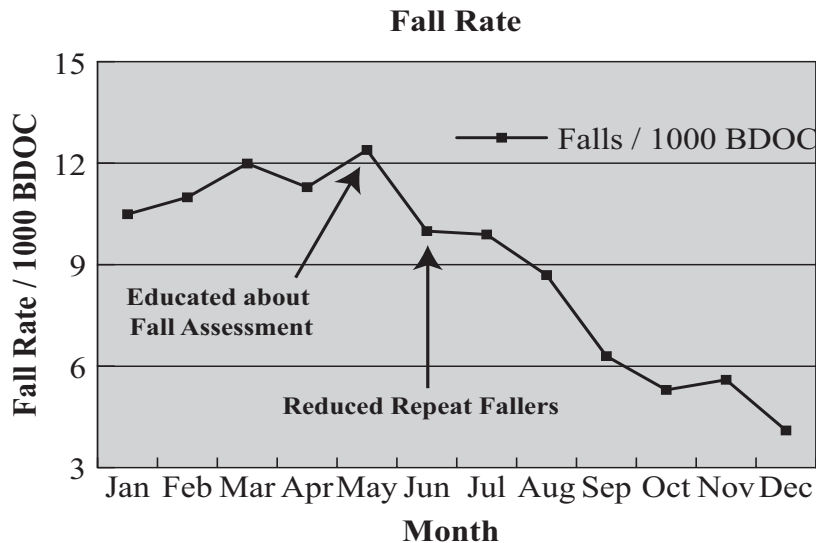
A. Run Charts

Run charts are used to track data over time. They are most often used to track data like fall rates or injury rates. It is important to clearly mark on the graph the months that the interventions were implemented. To show a difference you will want to take the average fall rate for the months prior to the interventions.

*Example** — The fall rates per 1000 BDOC at a facility for the last year are:

Fall Rate per 1000 BDOC			
January	10.5	July	9.9
February	11	August	8.7
March	12	September	6.3
April	11.3	October	5.3
May	12.4	November	5.6
June	10	December	4.5

In May, an education program was implemented and in June a program to reduce repeat fallers was implemented. The run chart for this is below:



To see if the interventions are working you will want to take the average fall rate prior to the interventions and after the interventions.

Month	# Falls	BDOC	Fall Rate per 1000 BDOC	Month	# Falls	BDOC	Fall Rate per 1000 BDOC
January	10	950	10.5	July	10	1010	9.9
February	11	1000	11	August	10	1150	8.7
March	15	1250	12	September	8	1275	6.3
April	13	1150	11.3	October	6	1130	5.3
May	13	1050	12.4	November	6	1080	5.6
June	11	1100	10	December	4	975	4.1
Totals	73	6500	11.2	Totals	44	6620	6.6

In this case, the average fall rate for January through June is:

$$((10+11+15+13+13+11)/(950+1000+1250+1150+1050+1100)) \times 1000 = (73/6500) \times 1000 = 11.2 \text{ per 1000 BDOC}$$

The average fall rate for the months after the intervention (July-December) is:

$$((10+10+8+6+6+4)/(1010+1150+1275+1130+1080+975)) \times 1000 = (44/6620) \times 1000 = 6.6 \text{ per 1000 BDOC}$$

This means that prior to the intervention the average fall rate was 11.2 and after the interventions the fall rate decreased to 6.6.

Prior to the interventions, the facility could expect 11.2 falls per 1000 bed days of care.

After the interventions, the facility could expect 6.6 falls per 1000 bed days of care.

If you want to analyze this further, you could take the variance of the data or do a statistical means test. Both of these can be done using functions in Excel™. For more information on this, please see the CD-ROM or Web site.

B. Bar Graphs

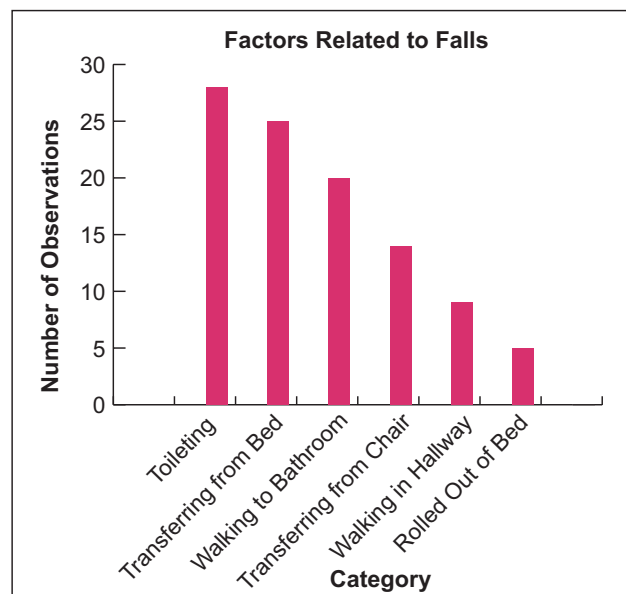
Bar graphs are used to visualize categorical data, like the location of patient falls or what the patient was trying to accomplish at the time of the fall. They can be used to target interventions where there is the highest risk. For instance if most of the falls are occurring while the patient is toileting then instituting a toileting schedules for at-risk patients may be an option. The bar graph is sorted with the largest category first going to the smallest category. It may be helpful to separate the data into separate charts, such as falls by location or shift.

Example:*

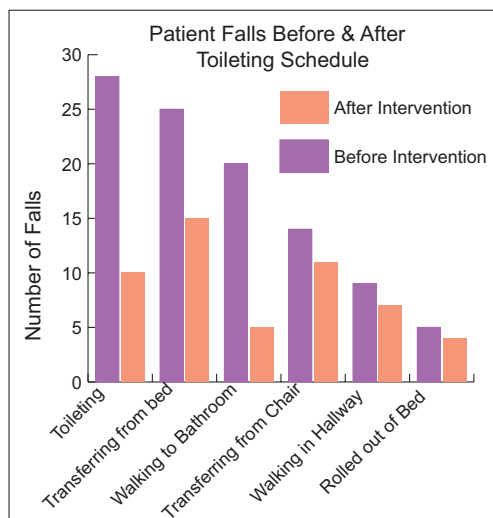
A facility tracked what the patients were attempting to do at the time of a fall. They found that the falls broke down into the following categories:

Toileting	28
Transferring	25
Walking to Bathroom	20
Transferring from Chair	14
Walking in Hallway	9
Rolled out of Bed	5

The data graphed into the following bar graph:



Bar graphs can also be used to show the incidence of certain factors before and after an intervention. For instance, after implementing a frequent toileting schedule for incontinent patients and patients with urgency, they found that the incidence of falls was:



As you can see there appears to be a difference before and after the toileting schedule was implemented. To find out more information on how to show that there is a statistical difference, see the Web site or the CD-ROM.

* Data in the examples are not real; they are examples to show the process of looking at the data, not guide any interventions.

¹ VHA National Center for Patient Safety. Patient Personal Freedoms and Security. Fall Prevention and Management. October 2001 <http://www.patientsafety.gov/FallPrev/howtostart.html> and DVA. (1996). Clinical Practice Guidelines: The Prevention and Management of Patient Falls).

² Veterans Health Administration Manual, Department of Veterans Affairs. Severity of Injury Level Scale, 35.07, M-2, Part 1, Chapter 35.