Quality Measurement
A Practical Guide for the Pharmacy

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— Part of HCPro’s Quality Measurement Series —


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CHAPTER ONE

HOW MEASUREMENT CONTRIBUTES TO NEW KNOWLEDGE
Length and weight measurements were made in Egypt as early as 3000 BC. The measurement of “how many” began when the Egyptians, Greeks, and Romans developed numeral systems. Around 600 AD, Hindus developed the decimal numeration system by adding the concept of place value and a symbol that meant “not any.”

The concept of measurement slowly made its way to healthcare. For centuries, England gathered data on the death rates of hospital patients. Florence Nightingale (1820–1910) pioneered quality improvement by using data as a basis for action in order to reduce death rates. Boston surgeon Ernest Codman, MD (1869–1941) was an early American proponent of monitoring and improving outcomes of surgical care.

Continued changes over the past 20 years have brought quality, measurement, and a philosophy of continual improvement to healthcare. However, the lack of valid measures to accelerate individual and team learning has been a great barrier to recent improvement efforts.

To guide you in developing measures to enhance learning and to result in better patient outcomes, we apply measurement to groups of patients, rather than to individuals (which involves clinical decision-making that is beyond our scope here). Nevertheless, many of the principles for measuring groups also apply to individual patients.

We focus on interpreting collective data and on determining the level of group you will measure, which you’ll determine based on what will optimize learning. For example, you can combine data
Why do caregivers and researchers need to develop their own measures of quality, especially when the National Quality Forum, the Joint Commission on Accreditation of Healthcare Organizations, and the Centers for Medicare & Medicaid Services are developing national measures? Because you simply need more measures than these organizations develop.
HOW MEASUREMENT CONTRIBUTES TO NEW KNOWLEDGE

You are faced daily with questions of what works and what does not. Therefore, as a caregiver, you need to develop measures in your local work environment, carry out interventions, and evaluate their impact. Without these tools, you inhibit your ability to learn and improve.

There are many areas you can measure, such as the following:

• If not open for 24 hours, how often and for what reasons does the night-nursing supervisor enter the pharmacy department?

• What percent of unapproved abbreviations does your hospital use?

• Did the new fax machine improve the time for medication delivery?

• Over a 24-hour period, how many patients received greater than the maximum recommended acetaminophen dose?

There are hundreds of opportunities to conduct daily measures. Our goal is to help you determine what to measure and how to measure it.

The importance of common definitions

For a measure to be useful, it must have a standard definition.

The medical record is a measurement system, but you generally learn little from it because it has standardized measures for certain data points but not for others. First, to find an average weight of a patient, you need a standard definition of weight. You must then decide whether to use admission weight, idealized weight, current weight, or dry weight. You also need a standard method for obtaining weight. Should you use the weight from the history? If so, will it be based on the patient or on a relative’s history? Or should you rely instead on the weight from the medical record, a bedside scale, a scale built into the bed, or a formula based on height and abdominal circumference?
You can use any of these methods. It is far more important—and is, in fact, necessary—to standardize a definition and a method to measure weight than it is to argue over which measure is more accurate. Aggregate data of an average weight are only meaningful if you use standard definitions and a standard method for obtaining weight.

**Benchmarking**

Having common definitions and methods of measurement is increasingly important when you compare your results with those of other organizations. Benchmarking is the process of comparing ideas, interventions, and outcomes with others. It helps generate new ideas and concepts that may be adapted for use in an organization’s improvement efforts.

Even with common definitions and methods, however, the value of benchmarking to one hospital over time may be limited. There are not many examples of one healthcare organization identifying another that performed exceedingly well, replicating its process exactly, and improving performance. That is because, although concepts can be copied, interventions need local modification.

The limited value of benchmarking isn’t surprising. Organizations differ in the skill of their individual caregivers, use of protocols, teamwork climate, leadership support, and information infrastructure. Each of these factors could affect whether an intervention identified in one organization could help improve the performance of another.

**Measurement principles**

There are five principles that will help you with measurement:

1. There is no true value of any characteristic that is defined in terms of measurement. Change the method of measurement and you change the result.
   
   — *W. Edwards Deming*
The point here is that measurement is relative. For example, you can determine a child’s height using a tape measure on the wall, a 12-inch ruler, or a scale like the one used in a doctor’s office. Each one, however, will produce a slightly different measure. Which is correct? All are. What is important is that you select a common method of measurement and use it consistently.

2. Our theories determine what we measure.

—Albert Einstein

The decision of what to measure doesn’t take place in a vacuum. Your experiences influence how you view the world, because you perceive it based on theories or conceptual models you know.

3. Scales and units of measures are chosen to optimize the learning of the user.

—Walter Shewhart

This issue is fundamental when using measurement for improvement. You often have many options available. For example, should the unit of analysis be one day, one week, one month, or one year? Decide based on what optimizes learning. That is, the unit should be small enough that you can both provide frequent feedback and evaluate the effect of interventions.

4. There is no need for measurement if the intended use is strictly historical.

—W. Edwards Deming

You measure to learn so that you can improve performance. But there is no point to measurement if your goal is solely to evaluate past performance and not apply what you learn to developing new interventions. View the process as a means to improve, not as an end in itself.

5. Statistical control (stability) of the process of measurement is vital; otherwise, there is no meaningful measurement.

—W. Edwards Deming
CHAPTER ONE

With measurement, try to determine whether an activity leads to an improvement, either in a process or in the outcome. If there is wide difference in baseline performance, however, variation among patients will be greater than the improvement introduced by the intervention, which makes the improvement very difficult to detect.

Take an analogy from signal engineering. Let’s say you want to determine whether a signal beacon is beeping. If you go into a soundproof room, it is easy to hear either way, but if you go into a wind tunnel, the background noise will limit your ability to hear the beep. Therefore, without a stable measurement process, you can’t evaluate the impact of an intervention.

How measurement contributes to new knowledge

Creating the proper environment for learning starts with getting buy-in from executives, the team, and the staff. It also requires that the team have a clear direction, adequate human and capital resources, the right skills, and a supportive reward system. Most importantly, teams need a common road map—a model for learning and improvement that integrates measurement to acquire knowledge.

One of the more successful models for improvement in healthcare is given in Figure 1.2. The model has two components: current knowledge and the plan-do-study-act (PDSA) cycle for learning and improvement. It represents a framework for improvement that is widely applicable and easy to use, and it helps you decide which actions to take and which not to take—based on existing knowledge—to meet the chosen objectives. As you take action and study the effects, the body of useful knowledge grows and enhances the power of those actions.
Current knowledge—the three questions

The following three questions form the first component of the model:

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What changes can we make that will result in improvement?

The answer to the first question provides a goal for the improvement effort, to keep it focused. To answer the second question, you must identify measures, which provide the foundation for learning
that is fundamental to improvement. Answering the third question requires some ideas for change, such as an intervention or idea for improvement. The knowledge to support an idea may already exist, or it may help develop an idea for change. These three questions define the end goal. Therefore, any effort to improve something would result in answers to these questions.

Cycle for learning and improvement—the PDSA cycle

The second component of the model is the PDSA cycle, which is an adaptation of the scientific method. Using it will enhance learning about the product, process, or system.

The PDSA cycle is used primarily to test and implement changes. It asks whether the change will result in improved performance of the product, process, or system in the future. It asks what additional knowledge is necessary to take action.

The PDSA cycle is a vehicle for learning. A deduction (i.e., prediction) is made based on some theory, and then observation is taken (i.e., data are collected). Next, the data are compared to the predicted consequences. A modification of the theory (i.e., learning) occurs when the consequences and the data fail to agree.

Knowledge becomes useful when it results in action. People often have preconceived notions of the course of action and search for data to support those notions. The obvious danger with this approach, however, is that no learning takes place; hence, improvements in quality may not occur.

Successful improvement and research teams navigate well through the road map described earlier. These teams desire new knowledge and have the support from leaders and frontline staff and resources, such as a project manager, research assistant, or analyst.

Endnote

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