

# How To Display Comparative Information That People Can Understand and Use

*Research conducted on behalf of the Robert Wood Johnson Foundation*



Robert Wood Johnson Foundation

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## Introduction

This guide sets out approaches you can adopt to make your displays of quality information more useful to health care consumers and, thus, more relevant and likely to be used. Simply reporting comparative information on quality is not hard, but doing it well can be quite a challenge.

This guide was prepared by the American Institutes for Research<sup>®</sup> (AIR<sup>®</sup>) team, led by Kristin Carman, PhD. Team members who participated in the conceptualization, writing, and editing of this report included Lise Rybowski, MBA, of The Severyn Group (lead writer), Kristin Carman, PhD, and Sandra K. Robinson, MSPH, of AIR, Shoshanna Sofaer, DrPH, of Baruch College; and Judith Hibbard, DrPH, of the University of Oregon.

The National Program Office of the Robert Wood Johnson Foundation's (RWJF's) *Aligning Forces for Quality* (AF4Q) sponsored this work.

Formally launched in 2008, AF4Q is the RWJF's signature effort to improve the quality of health care in targeted communities. AF4Q operates in 17 regions nationwide, with the goal of bringing together everyone who gets, gives, and pays for health care to lift the quality of care provided locally and to provide models for national reform

### Related Materials

This guide is the first in a series of technical assistance products developed by AIR to support the efforts of Alliances to engage consumers in using quality information. This initial series will include the following materials to be created by fall 2010:

- How to report results of the CAHPS Clinician & Group Survey
- How to describe chronic conditions in the context of comparative performance reports
- How to get consumer feedback and input into Web sites

#### **You can use this guide to:**

- Evaluate the display strategies in your own report;
- Explore an array of display strategies that can improve the clarity and usability of comparative quality information; and
- Identify the strategies that will help you communicate more effectively with consumers, which is a first step towards encouraging them to be more actively involved in their own health care.

## What You Will Find Here

After a brief review of the challenges to displaying comparative information, this guide discusses ways to make it easier for consumers to understand, interpret, and use your performance report. It then recommends strategies that you can implement alone or in combination to overcome two problems common to reports that compare health care quality:

- “Information overload,” which occurs when users of the reports are overwhelmed with too much information to process and use.
- Bewilderment, which occurs when users can’t find what they want or understand what they have.

For each strategy, you can read a description (with one or two examples<sup>1</sup>), learn how the strategy helps users understand and interpret the information, review advice on how to implement the strategy, and see what happens when the strategy is applied to a display of quality information. It is important to note that the guidance offered in this section is based on research with consumers to identify the display strategies that help them understand and interpret comparative information accurately.

While consumer feedback is crucial to making Web sites relevant and useful to audiences, displaying quality data requires complex cognitive processing of information. Thus, our recommendations draw very strongly

### A Checklist for Evaluating Your Display

Use these criteria to assess your approach to presenting comparative information on quality to consumers.

Criterion	Yes	No
Does the display enable users to pay attention to what matters most to them?	<input type="checkbox"/>	<input type="checkbox"/>
Does the display give priority to the information needs of the people who are the target audience for the Web-based report?	<input type="checkbox"/>	<input type="checkbox"/>
Does the display use language that the target audience can understand?	<input type="checkbox"/>	<input type="checkbox"/>
Does the display make it easy for users to see the performance of multiple health care providers at the same time?	<input type="checkbox"/>	<input type="checkbox"/>
Does the display make it easy for users to compare the performance of one provider to other providers and/or a meaningful point of comparison (also referred to as a comparator), such as an average score, and quickly identify high and low performers?	<input type="checkbox"/>	<input type="checkbox"/>
Does the display help users identify the areas of quality in which different providers perform well and not so well?	<input type="checkbox"/>	<input type="checkbox"/>
When possible, does the display present different kinds of information in a consistent way?	<input type="checkbox"/>	<input type="checkbox"/>
Does the display help the user identify the level of quality across the providers in a community, for example, by showing how local performance compares to state or national performance?	<input type="checkbox"/>	<input type="checkbox"/>
Does the display help the user bring different pieces of information together to choose the provider that is best for that person?	<input type="checkbox"/>	<input type="checkbox"/>

If you answered “no” to any of these questions, check out how the strategies in this guide could help you produce a more effective display

<sup>1</sup> Examples drawn from current Web-based quality reports are intended simply to illustrate the use of various strategies and are not meant to endorse any specific design.

on studies that provide lessons on how to support individuals to accurately interpret and understand comparative information. For example, consumers will often say that they want more information on a single page than they can accurately interpret and apply. Some key background research on the processing of complex information is available on page 41.

Unfortunately, no display strategy is right for every circumstance. Each report has its own measure sets, data sources, and scoring strategies, as well as local audiences and stakeholder groups who have their own needs and preferences. At the end of the guide, you will find guidance on how to identify the strategy or combination of strategies that are best for you, given your circumstances and your objectives.

## Why Does “Good” Reporting Matter?

A Web-based report comparing the quality of health care providers is typically designed to inform both health care consumers and providers and to encourage them to take actions that will result in better care and better health. Ideally, consumers will use the information to:

- Compare the quality of health care providers in a community.
- See how their provider performs in different categories.
- Assess the quality of care available for a specific condition.

Providers, for their part, will use the information to pinpoint areas in need of improvement and to make necessary changes.

Among the many factors that will determine your success in reaching these goals is how you choose to display comparative quality information. The strategies you use to present these data can help your Alliance make progress towards the broader objectives of a quality report—or they can undermine your efforts. A good display will:

- Capture the user’s attention.
- Facilitate understanding of the differences in quality.
- Motivate and enable use of the information.

In addition, a good display can result in return visits to the Web site as well as increased use of the site, thanks to positive “word of mouth.”

A display that presents users with the equivalent of visual noise, on the other hand, will quickly drive people away from your Web site.

## What's So Hard About Displaying Information on Health Care Quality?

Over the last two decades, report sponsors have generated several hundred examples of reports with comparative information on health care quality.<sup>2</sup> Many of these reports offer vivid examples of what *not* to do if your objective is to give consumers information they can understand, interpret and use.

People publish comparisons of products and services all the time. Why is it such a challenge to present comparative information on health care quality? Complicating factors include the data and measures, the audience, and the environment of quality reporting.

### The Data and the Measures

**Variety of data and data sources.** The nature of the data can affect displays. Some data arrive “raw” from medical records and administrative databases and require additional steps to become usable performance scores. Other data come to a report sponsor already analyzed and evaluated in a way that may not easily mix with other scores (e.g., information on practice-level performance from the *Bridges to Excellence* program, which groups practices into levels).

**Dissimilarities in quality measures.** Quality measures differ in various ways, which can make it hard to present them consistently. For example, most measures capture positive actions or outcomes, so a higher score is better. Other measures, such as mortality or patient safety indicators, focus on negative actions or outcomes; thus, a lower score is better.

Also, not all quality measures are relevant to everyone. Some measures matter only to subsets of patients and families dealing with specific conditions (such as diabetes). Many quality measures are at a level of detail that is not really helpful to most consumers. The primary value of the detail is for health care providers, who can use the information to assess and improve their work.

### The Audience

**Uninformed or uninterested audience.** For most people, information on health care quality is new.<sup>3,4</sup> Not only is it unfamiliar, but it is unwanted in the sense that many people do not know this is information that can be helpful to them, so they do not seek it. A related issue arises when the information that is available (e.g., information on quality at the clinic level) doesn't address what people really want to know (e.g., quality at the doctor level). Consequently, a display of quality information has to do more than show the information in an understandable and usable way; it has to communicate relevance and importance.

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<sup>2</sup> To find examples, check out the Agency for Healthcare Research and Quality's Report Card Compendium at [www.talkingquality.ahrq.gov](http://www.talkingquality.ahrq.gov) or the Informed Patient Institute's Web site at <http://www.informedpatientinstitute.org>.

<sup>3</sup> Sofaer S, Firminger K. Patient perceptions of the quality of health services. *Annual Review of Public Health*. 2005; 26:513–559.

<sup>4</sup> Carman KL, Maurer M, Yegian JM, Dardess P, McGee J, Evers M, Marlo KO. Evidence that consumers are skeptical about evidence-based health care. *Health Affairs (Millwood)*. 2010 Jun 3. Available at <http://content.healthaffairs.org/cgi/content/full/hlthaff.2009.0296v1>.

**Inexperienced audience.** Even people who understand the relevance of quality information and are interested in it are not necessarily able to interpret and use it. Data displays have to overcome several common characteristics of users,<sup>5</sup> including the following:

- Many people are unable to interpret numerical displays (such as a table listing numerical scores) or understand basic statistical terms (such as “average”), so they cannot use this kind of information.
- Even people who can interpret the numbers have a limited ability to process many pieces of information at the same time.<sup>6</sup>
- Very few people can easily weight and combine different factors to match their own priorities.

## The Environment

**High stakes.** Anytime one is talking about health care, the stakes are high. No one wants to make a mistake by misrepresenting the level of a provider’s quality, particularly if it could steer users towards low-performing providers or away from high-performing providers.

**Competing priorities.** The organizations that report on health care quality typically juggle multiple demands. Even groups that are not explicitly “collaborative” often have to satisfy a variety of stakeholders. This inherent tension makes it difficult to design and implement a display that will please everyone.

**Limited resources.** All report sponsors face limits on the resources—including money, time and expertise—they can put into developing a comparative quality report. In an ideal world, sponsors might develop and test a variety of displays to ensure they meet the needs of the audience. In the real world, time is short and funds are constrained.

**No one right answer.** Although researchers have learned a great deal about how to make displays of quality information understandable and useful to health care consumers, that does not mean there is a single display strategy that is right for every circumstance. Sponsors of quality reports still have to figure out which strategies—alone or in combination—are best suited to the information they have and the audience they are trying to reach.

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<sup>5</sup> Peters EM, Hibbard JH, Slovic P, et al. Numeracy skill and the communication, comprehension, and use of risk and benefit information. *Health Affairs*. 2007 May–June; 26(3):741–748.

<sup>6</sup> Miller GA. The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychology Review*. 1994 Apr; 101(2):343–352. Available at <http://www.musanim.com/miller1956>.



## What Can You Do? An Overview of Recommended Display Strategies

### The Three Goals of a Good Display of Comparative Information

This guide presumes your primary audience is health care consumers—but it is important to recognize that the principles underlying the recommended display strategies apply no matter who views the information. Even the most experienced users of quality data need help organizing and digesting the information.

Doing some of the cognitive work for the end users of the information helps them by lessening the work they have to do. To provide that kind of help to users, set your sights on one or more of the following three goals:

1. **Make it easy to identify and understand patterns.** To make sense of large quantities of information, people seek patterns that allow them to see which options are better or worse. When looking across multiple quality measures for a set of hospitals, for example, users will try to identify the hospitals with better scores so they can determine which hospital performed best across the most measures. When they cannot find any patterns in the information, they are less likely to understand, interpret, and use it effectively. A number of display strategies help to make those patterns more readily apparent.

#### Example: Oregon Health Care Quality Corporation's report on medical groups and doctors' offices

This example illustrates the use of word icons to help users see patterns in scores across multiple measures, making it easy to identify strong and weak performers.

	"Dilated" eye exam (checks for blood vessel damage in the eyes) (what is this?)	"A-1-C" blood sugar test (measures level of blood sugar during past 3 months) (what is this?)	Cholesterol test (checks the level of "bad" cholesterol) (what is this?)	Kidney disease test (urine test for signs of kidney disease) (what is this?)
NW Primary Care Milwaukie Family Practice	Better	Better	Better	Better
NW Primary Care Sellwood/Moreland Clinic	Average	Better	Better	Better
NW Primary Care Talbert Center Family Practice	Average	Better	Average	Better
OHSU Family Medicine at Gabriel Park	Average	Average	Average	Average
OHSU Family Medicine at Richmond	Below	Below	Below	Average

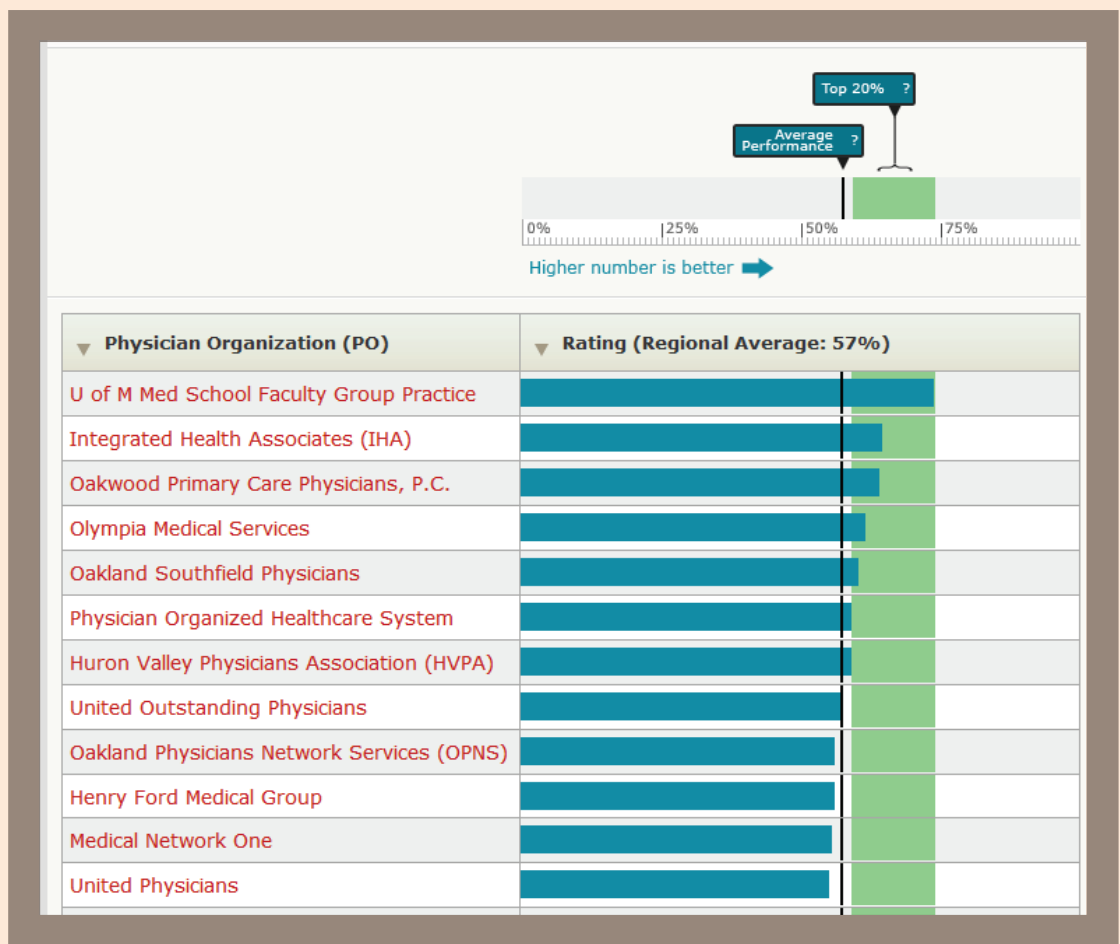
Source: <http://www.partnerforqualitycare.org/index.php>



2. **Help users focus on topics or providers of interest.** When faced with many data points, people will look for ways to limit how much information they have to take in. Some display strategies help users organize information in a way that highlights the topics of most interest. This display allows users to focus on a limited set of topics or providers and shut out the rest. When users do that, they perceive that there are fewer data to deal with, even though all of the original information is still available.

**Example:  
Greater Detroit Area Health Council's report on  
quality of diabetes care from physicians**

This example illustrates how listing providers in order of performance helps users hone in on the top performers.



Source: [http://mycarecompare.org/site/reports.php?r=&rc=Diabetes&s=physician\\_organizations&v=physician\\_organizations\\_report](http://mycarecompare.org/site/reports.php?r=&rc=Diabetes&s=physician_organizations&v=physician_organizations_report)

3. **Reduce the amount of information for users.** For the majority of people who look at comparative information on health care quality, less is more. They are not interested in exploring the details of each provider's performance. They simply want to get a sense of which providers are the best overall, with as little effort as possible. Some display strategies achieve this goal by giving users only a small number of data points. More detailed information is then available in a second or even third layer for those who want it.

Of course, the likely users of comparative quality information vary in their interests, their values, and their willingness and ability to sift through data. To some extent, all of these goals also involve helping people use the information in a way that is consistent with **their** priorities—in terms of how much and what information they use and how they use it in combination with other considerations.

## Mapping Display Strategies to Goals

To help people feel less overwhelmed by the amount of comparative information in a quality report, better able to focus on their interests, and better equipped to digest and use the information to explore alternative choices and make decisions, you can apply one or more of the following display strategies:

- Explicit Points of Comparison
- Symbols
- Word Icons
- Helping Users Limit the Number of Providers They Compare
- Rank Ordering and Tiering
- Quality Framework
- Composite Measures
- Summary Scores

### Example: California HealthCare Foundation's report on long-term care providers

This example illustrates how to reduce the amount of information by using word icons that represent the overall performance of long-term care providers.

MAP #	NAME	TYPE	RATING
1	Sutter Oaks Nursing Center-Midtown	NH	BELOW AVERAGE
2	Pioneer House	NH	AVERAGE
3	Saylor Lane Healthcare Center	NH	SUPERIOR
4	McKinley Health Care Center	NH	POOR
5	Valley Skilled Nursing Facility	NH	SUPERIOR

Source: <http://www.calqualitycare.org>

The following table shows how each of the strategies maps to the goals described above. Note that none of the strategies succeeds in achieving all three goals on its own. In combination, however, these strategies enable users to assimilate the information in whatever way works best for them.

Strategy	Goal Achieved		
	Makes It Easier To Identify and Understand Patterns	Helps Users Focus on Topics or Providers of Interest	Reduces Amount of Information for Users
Explicit Points of Comparison	✓		
Symbols	✓		
Word Icons	✓		
Helping Users Limit the Number of Providers	✓	✓	
Rank Ordering and Tiering	✓	✓	
Quality Framework	✓	✓	
Composite Measures		✓	✓
Summary Scores			✓

This section of the guide describes each strategy and what it helps you to achieve, offers guidance on implementing the strategy, and presents “before” and “after” illustrations to help you see how the strategy may be applied. The “before” graphics in those illustrations are loosely based on existing displays in quality reports. The authors have pared down and restyled the original displays to help readers focus on the impact of implementing each display strategy.

When you apply these strategies to your own displays, be sure to test whether they help people in your community understand and use the information. It is also important to give local providers an opportunity to review the displays before you make them public so that they can express any concerns.

## Explicit Points of Comparison

### What's the idea?

To give users a larger context for interpreting a quality score, it is helpful to give them one or more points of comparison (also referred to as a *comparator*). When users review numerical scores (or a visual representation) for one or more quality measures, the point of comparison is what allows them to tell whether a provider's performance is good. For example:

- Is it typical for providers in the community?
- Is it better or worse than others?
- Is it “good” by objective standards?

In the absence of that kind of information, the numbers have little meaning to users.

### Common examples of comparison points include:

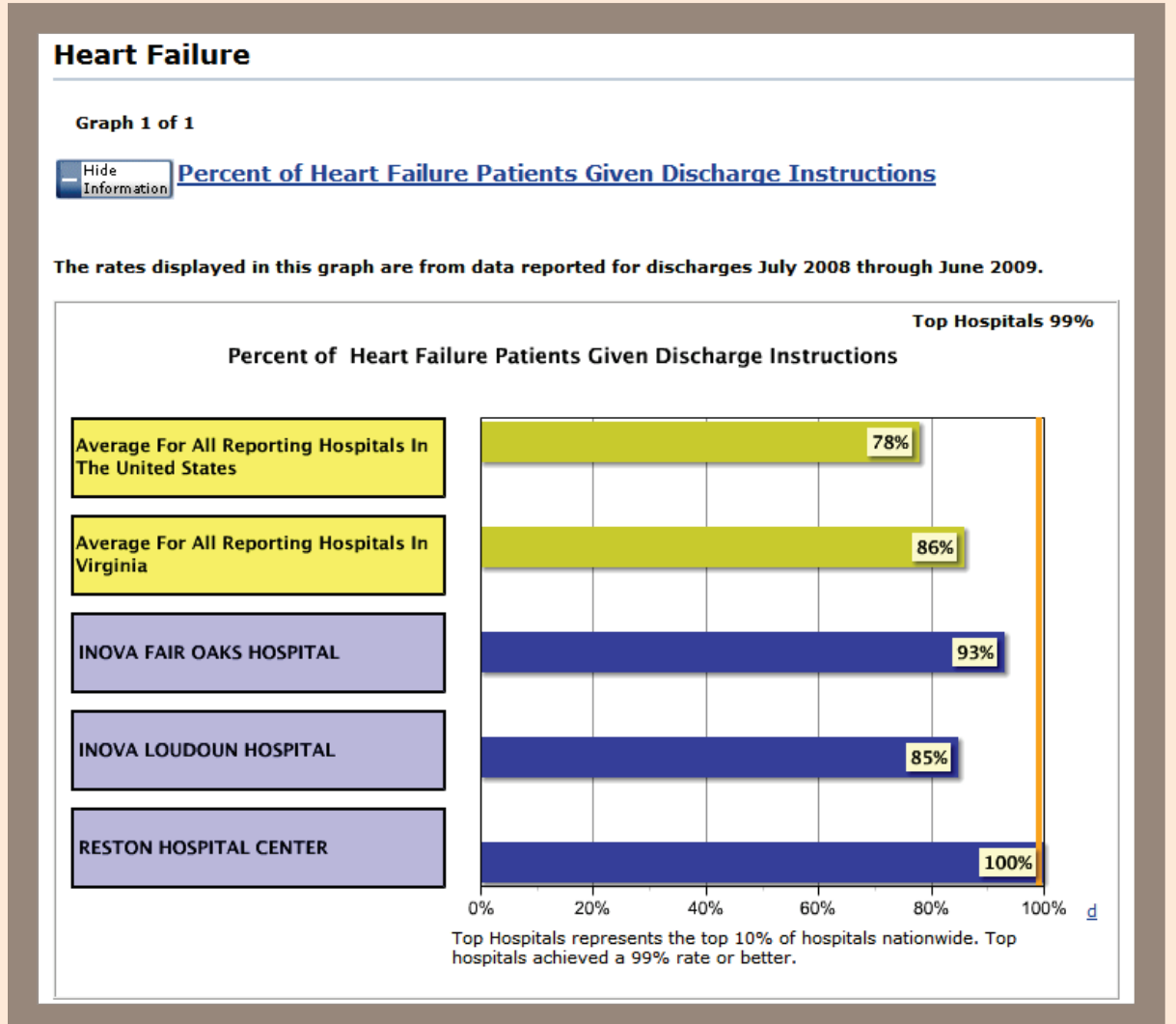
- The average score for the state or community.
- The average score for the nation.
- The cut-off score for those organizations that performed in the 90th percentile (i.e., the top 10 percent).
- The best performance possible.
- The expected score for a hospital, such as the expected mortality rate for heart surgery patients.

In the context of a numerical display, a point of comparison should be **explicit** in the sense that the actual number is shown. It can also be **implicit**—that is, not actually shown. For example, some quality reports show both numbers and symbols (e.g., arrows pointing up and down) to signify how the absolute score relates to the comparison point. However, this combination of symbols and numbers puts too much information in one place. Given such dense information, users struggle to identify patterns that allow them to make sense of the data.

Strategy: Explicit Points of Comparison	
Goal Achieved:	
✓	Makes It Easier To Identify and Understand Patterns
	Helps Users Focus on Topics or Providers of Interest
	Reduces Amount of Information for Users

**Example:  
The U.S. Department of Health and Human Services'  
Hospital Compare Web site**

This example shows state and national averages as comparison points for a hospital quality measure.



Source: <http://www.hospitalcompare.hhs.gov>

**Why do it?**

Publishing one or more points of comparison for quality scores can do several important things for a public report:

- Give users of the information some basis for evaluating and making sense of providers' quality scores.

- Convey a message about how good health care typically is. Seeing how your community’s providers compare to a state or national average, for example, gives both lay and professional users of the data a context for assessing local care.
- Establish a minimum standard for quality. By setting a “floor,” the comparison point communicates that a quality score below a certain level is unacceptable, which can drive providers to make improvements.
- Establish a high standard for quality. For example, a comparison point set at the cut-off point for the 90th percentile of performance conveys the message to consumers that they can get truly excellent care. For providers, this kind of comparison point lets them know that it is not enough to be above the average and that other organizations have found ways to provide better care.

## Implementation considerations

**Determining whether there is an agreed-upon point of comparison.** There may not be a meaningful comparison point for the measure you are reporting. For example, although clinical experts agree that hospitals should perform neither too many nor too few Cesarean sections, no one knows whether it is better to be above or below the average. Measures of procedure volume also lack an established point of comparison. For most procedures, the more experience the clinicians have with a procedure, the better the outcomes. But there is not always research evidence to determine where the threshold should be.

**Choosing the “best” point of comparison.** Although many report sponsors simply display the average performance, you may want to determine which comparison point is “best” for a quality measure given the circumstances in your community, including the actual distribution of scores. When assessing your options, consider what your answers would be to the following questions:

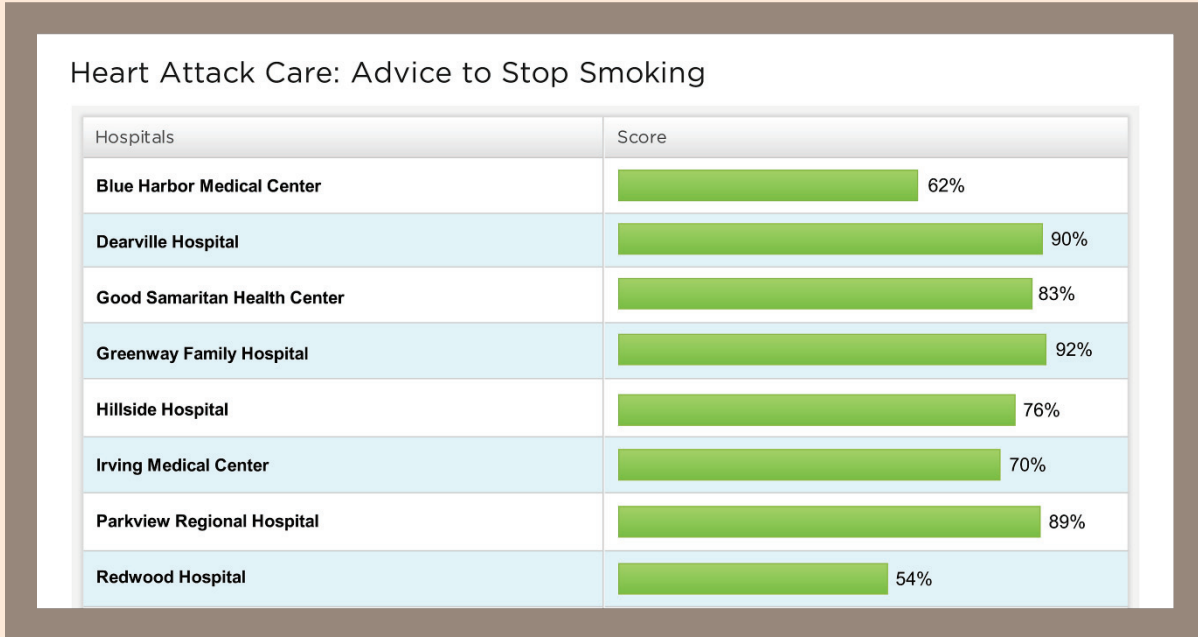
- Which point of comparison will help health care consumers recognize differences in performance?
- Which one will motivate providers to improve care?
- Is the comparison point that is best for one purpose also best for the other?
- Can you use a similar comparison point for all of the measures you present?
- Does the comparison point help users understand whether care in the entire community could be better (e.g., if the average performance is fairly low)?
- Will your stakeholders accept a comparison point that holds providers to a higher standard?

**Explaining the point of comparison.** Many people do not understand comparison points based on statistical calculations such as percentile scores and averages. One useful approach is to explain the comparison point by focusing on its purpose. For example, the purpose of using the 90th percentile as a comparison point is to let people see how the performance of individual providers compares to those who perform best.

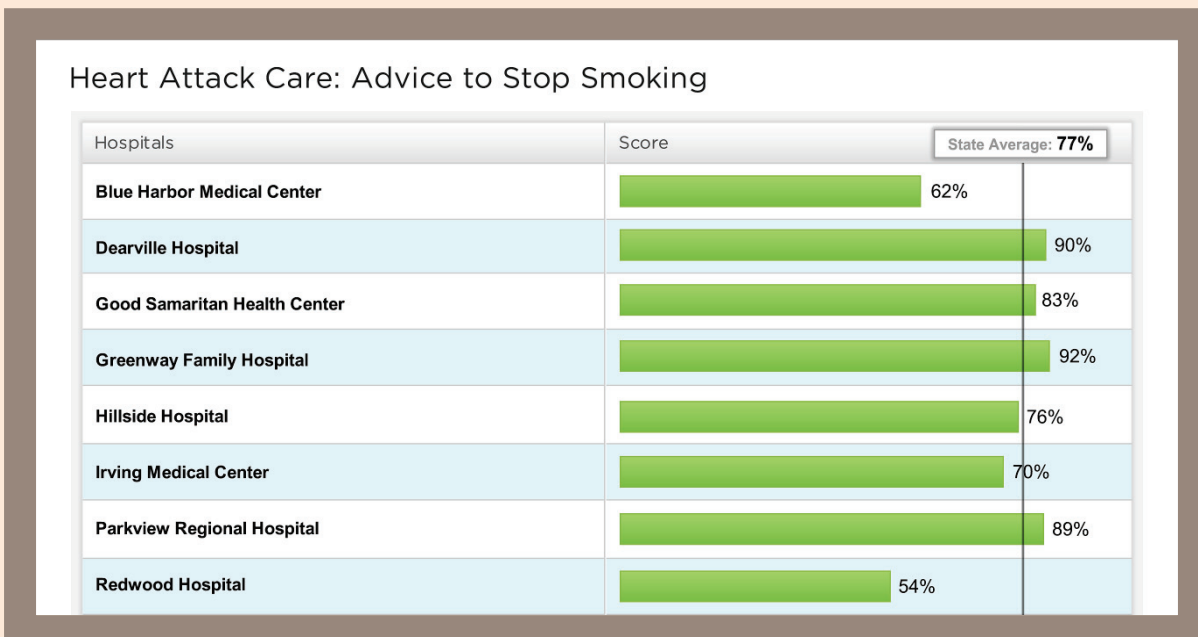
### Applying this strategy: A “before and after” example

This example illustrates how a point of comparison can be incorporated into a bar chart that displays a measure of heart attack care for hospitals.

*Before:* Each bar represents one hospital’s score on the measure. No point of comparison is provided.



*After:* A point of comparison—in this case, the average for all hospitals in the state—is shown as a line that crosses all of the bars.





**Displaying the point of comparison.** If you are reporting scores using bar charts, you need to find a way to show the comparison point so that people are aware of it but not distracted by it. When the list of providers is short, it is sufficient to show the comparison point as a separate bar at the top of the list or within an ordered list so that those with higher scores are listed above it and those with lower scores are listed below it. In longer lists, it is preferable to integrate the comparison point into the display so that it is not lost when the user scrolls down the page. (See the “Before and After” example below for an illustration of this approach.)

**Caveat regarding numerical displays:**

- **Determining whether differences in numbers are meaningful.** When both the quality scores and the comparison point are displayed as numbers, users may focus on differences in performance that are not statistically significant. Whether a score of 80 is statistically different from an average score of 78, for example, depends on the data underlying how the scores were calculated. Presenting a comparison point does not, in and of itself, address the question of whether differences in scores are statistically significant or substantively meaningful.
- **Overwhelming users with a “wall of numbers.”** A “wall of numbers” is what users face when presented with a large table full of numerical scores for several measures. No matter how clearly the comparison point is presented and explained, many users are simply overwhelmed by the amount of information in front of them. They are unable to interpret what they are looking at.

## Symbols

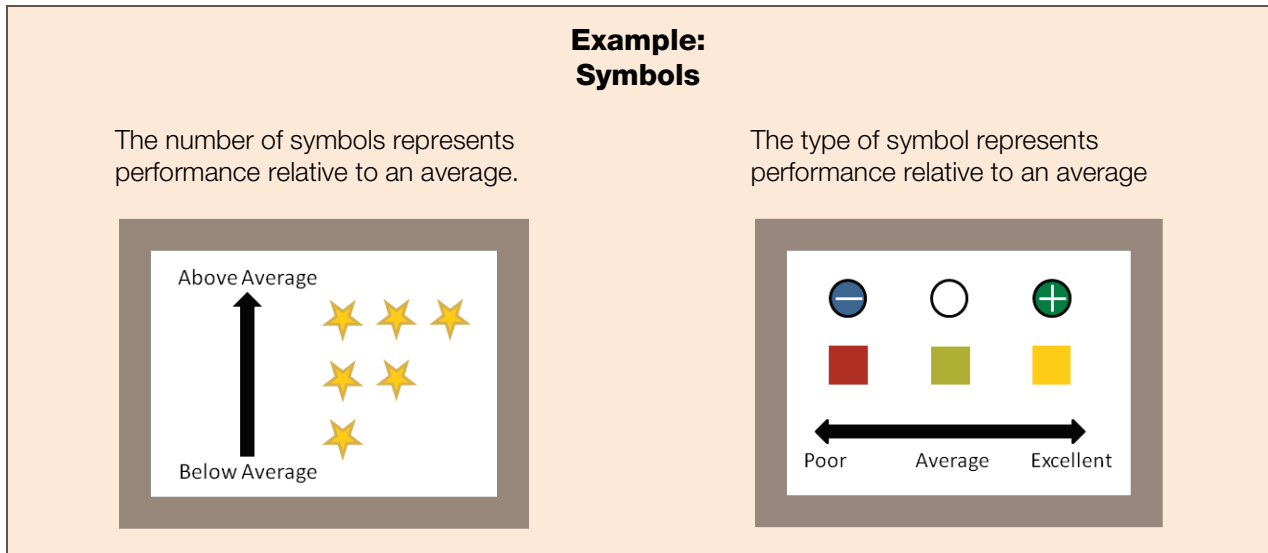
### What’s the idea?

Displays of symbols are an efficient way to communicate how a provider performs *relative to a single point of comparison* (e.g., a local average) without either showing numbers or making users assess for themselves whether the difference is meaningful. This visual shortcut lets users quickly see how providers compare to each other and determine whose performance is better or worse than the chosen comparison point. The use of symbols can also make it easier to assess a single provider’s performance across multiple measures.

Strategy: Symbols	
Goal Achieved:	
✓	Makes It Easier To Identify and Understand Patterns
	Helps Users Focus on Topics or Providers of Interest
	Reduces Amount of Information for Users

This discussion focuses on two well-established variations on this strategy:

- A repeated graphic in which the number of symbols represents performance relative to an average (i.e., higher or lower than the average)
- A repeated graphic in which either the number of symbols or the symbol itself represents a scale of “poor” to “excellent”



A third, newer application of this strategy involves the use of word icons, where each combination of a symbol and a word communicates a level of performance. This strategy is discussed in the next section.

### **Why do it?**

The use of symbols overcomes many of the visual and cognitive challenges posed by numerical displays. In particular, symbols address the barrier of innumeracy; half of the American population has trouble deriving meaning from numbers.<sup>7</sup> It is not necessary to understand or interpret the numbers behind symbols to understand and use them.

Symbols also offer a way to communicate relative performance concisely and clearly. The differences in scores are evident, and the method of assigning scores into categories (e.g., above average, average, and below average) can ensure the statistical significance of those differences.

In addition, certain symbols offer the benefit of being familiar to consumers, who have become accustomed to seeing symbol ratings—especially stars—in the context of many choices, including hotels, restaurants, cars, and books. For similar reasons, they are familiar to health care providers as well. Symbols are increasingly acceptable as providers come to appreciate the usefulness of interpreted information on quality. The use of symbols is already well established in reports comparing the quality of health plans and hospitals.

Finally, symbols generally are easy for consumers to use to assess the relative performance of providers on specific measures and determine which perform better overall.

<sup>7</sup> See: Paulos JA. *Innumeracy: Mathematical illiteracy and its consequences*. New York: Hill and Wang; 2001. Peters EM, Hibbard JH, Slovic P, Diechmann N. Numeracy skill and the communication, comprehension, and use of risk and benefit information. *Health Affairs*. 2007 May/June; 26(3):741–748.

## Implementation considerations

Overall, implementing symbols is a highly feasible display strategy. However, you must take several steps to avoid misrepresenting the level of providers' performance or inadvertently leading users to misinterpret the information.

**Setting cutpoints.** Sorting providers into performance categories requires a judgment of where to draw the lines (referred to as cutpoints) that separate each category from the others. It also involves determining where to put providers whose performance is close to the cutpoint (i.e., they could easily go in either category). Whether a provider gets two stars or three, for example, depends on how those statistical decisions are made. One effective strategy for dealing with this issue is to err on the side of giving providers the benefit of the doubt and putting them into the relatively higher category.

**Showing variations in performance.** The use of symbols to show relative performance loses its value when performance doesn't actually vary significantly across providers. Reports showing two stars to represent "average" for all providers simply conveys the message that everyone is the same. This information conflicts with the goal of helping consumers understand that health care quality varies. In many cases, you can address this problem by applying a different scoring strategy or using a different point of comparison (such as the 75th percentile rather than the mean) to raise the bar and reveal differences in performance.

**Selecting symbols with clear meaning.** While it may seem straightforward, choosing a symbol for the purposes of comparative reporting is not easy. In addition to the shape of the symbol, you have to select a color and decide whether to include words and what those words will be. The best symbols are ones that do not require an explanation and make it easy to see the performance of providers relative to each other. One way to do that is to create a contrast in color and/or shape between the high and low performers so that the differences stand out.

No matter what you choose, it is critical to test the symbol and its color with your likely audience to understand what the display means to that audience and how the audience would use the symbol to interpret performance. Also, for some populations, shapes and colors may have a significance that you could not anticipate.

Familiar symbols, such as stars, are reliable choices, but they have their own potential problems. For example, although people recognize stars as symbols, they do not necessarily interpret them as intended. In many displays, two stars means that performance is average. A consumer accustomed to thinking that five stars signifies the best performance may associate two stars with poor performance.

Unfamiliar symbols, on the other hand, can add complexity to a report if users do not understand what they mean or how to interpret them. Some reports use symbols that are so unfamiliar or unintuitive that even consumers who use the legend are confused. When symbols are hard for users to understand, it becomes difficult for users to identify patterns that show how providers compare to each other across multiple measures.

It is also important to use symbols consistently in your report and to not mix several different symbols in the same display.

**Providing a legend.** To address any confusion about the symbols, the standard solution is to provide some kind of legend that explains each symbol. Legends should be provided on the same page as the comparison table, generally above the table to increase visibility. Ideally, the legend should also remain visible while the user scrolls down the page.

Unfortunately, the legends themselves increase the cognitive burden of using information. Moreover, consumers often do not notice or refer to the legend, thus increasing the chances that they'll misinterpret what the symbols mean.

**Helping people summarize.** When faced with a table full of symbols, people typically attempt to summarize performance by calculating a total for each provider. This approach is not necessarily wrong, but it can lead users to incorrect conclusions. They may make mistakes as they add the numbers of symbols, or they may lose track of the totals across multiple providers. Another issue is that this approach requires users to give each measure an equal weight, which may not accurately reflect the importance of specific measures.

Report sponsors can help users by:

- Making it easier for them to count accurately.
- Not including measures with relatively low value to users.
- Providing a summary of scores across multiple measures (see the last strategy on “Summary Scores” on page 39).

**Giving people ways to limit what they're seeing.** Even symbols that are regarded as easy to understand can be overwhelming in large quantities. Symbols cannot compensate for too much information. One way to make symbols more effective is to combine this strategy with one that allows users to limit what they see (e.g., by viewing results for only certain providers, or by viewing only certain measures or summary measures for all providers).

#### **Caveats regarding symbols in displays:**

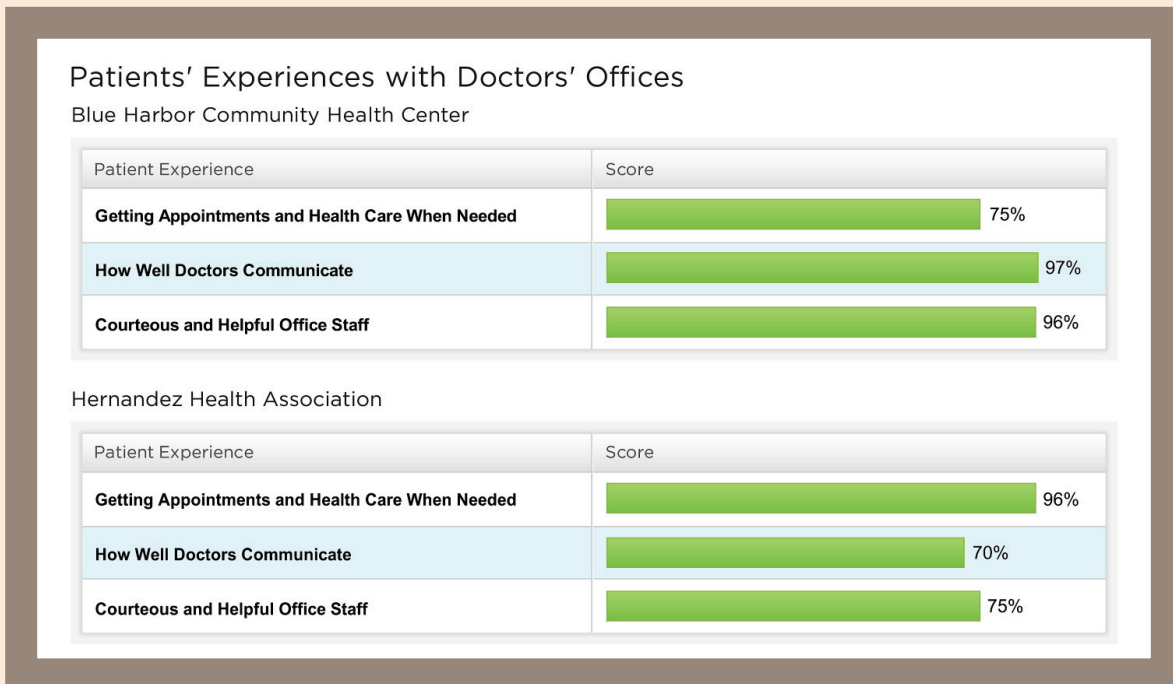
- **The impact of symbol displays on efforts to encourage providers to improve.** The problem with showing relative performance is that providers have to aim for a moving target. If the average score increases by several percentage points, a one-star provider that also increases its own score by several percentage points may still get just one star, even if the new score exceeds the old average. Thus, information that makes it easier for consumers to understand quality scores may become a source of frustration for providers. Alliances will need to find other ways to recognize and celebrate improvements in quality.
- **Providing a broader context for performance.** Symbols can misrepresent performance if they show how providers scored relative to each other without indicating how the average performance compares to state or national benchmarks. If the overall average is low, a provider with five stars is not really providing good quality care. If the overall average is high, even a provider with just one star may be providing excellent care. In the latter case, the symbols may be making a distinction that some providers will regard as

unfair. Your Alliance will have to choose which comparison point to use, recognizing that no approach can convey two messages at the same time.

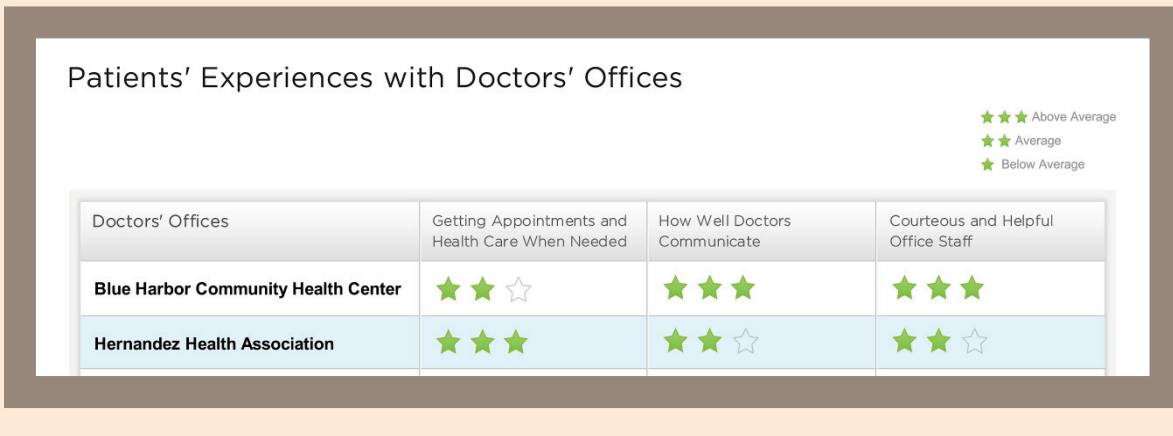
### Applying this strategy: A “before and after” example

This example illustrates how a display of stars can replace a display of bars representing the performance of medical practices on measures of patient experience.

**Before:** For each physician group, a set of bars shows the scores for measures of patient experience with care.



**After:** The relative performance of each physician group on the measures is represented by one, two, or three stars.



- **The limits of using symbols to convey differences.** Even when symbols are easy to understand, a whole page of symbols (e.g., for multiple measures and multiple provider organizations) is visually overwhelming and difficult to interpret.

## Word Icons




### What's the idea?

Word icons combine graphic symbols with words that clearly indicate the category of performance for a provider based on its scores relative to a comparison point. Like graphic symbols, word icons use visual cues to help users understand which providers are scoring better or worse than others. Rather than repeating a graphic, however, word icons use different shapes and colors to communicate differences.

Word icons also take the idea of a visual cue one step further by essentially incorporating the legend into the symbol so that there is little opportunity for misinterpretation. This approach avoids any miscommunication associated with summing up the number of symbols.

Strategy: Word Icons	
Goal Achieved:	<ul style="list-style-type: none"> <li>✓ <b>Makes It Easier To Identify and Understand Patterns</b></li> <li>Helps Users Focus on Topics or Providers of Interest</li> <li>Reduces Amount of Information for Users</li> </ul>

### Example: Word icons

	scored <b>above (better than)</b> the average score for all doctors on the chart
	scored <b>about the same as the average</b> score for all doctors on the chart
	scored <b>below (worse than)</b> the average score for all doctors on the chart

Source: Carman KL. Improving quality information in a consumer-driven era: Showing differences is crucial to informed consumer choice. Presentation delivered at the 10th National CAHPS User Group Meeting, March 31, 2006. Available at [https://www.cahps.ahrq.gov/content/community/events/UGM10/files/DAY2\\_c&d\\_1\\_Carman.pdf](https://www.cahps.ahrq.gov/content/community/events/UGM10/files/DAY2_c&d_1_Carman.pdf).

### Why do it?

This strategy addresses many of the limitations of graphic symbols listed above. Word icons are self-explanatory, which leaves less room for misunderstanding or misinterpretation by users.

They can also make it easier for users to detect patterns in the display, especially if the user can rely on both colors and shapes to assimilate information across measures and identify stronger and weaker performers. The word icons reduce the effort required of the user to understand and use comparative information.



## Implementation considerations

Word icons are no harder to develop than other symbols. Report sponsors face the same challenges of negotiating cutpoints and determining how to categorize scores that are close to a cutpoint. On the other hand, word icons do not require a legend, thus eliminating one of the hurdles associated with graphic symbols.

**Overcoming the political challenges will require some upfront effort:**







### **Educating stakeholders on the merits of this strategy.**

Because of the explicitness of the labels, you can anticipate some pushback from stakeholders, particularly providers who regard the labels as discouraging. To counter that perspective, it will be especially important to communicate the benefits of this strategy for consumers and to clarify that the word icons do not capture any information that isn't already available through other display strategies.

### **Being flexible about the point of comparison.**

Depending on the circumstances in the community, stakeholders may also be concerned about the risk of placing a negative label on a provider whose performance isn't actually poor. For example, when compared to national norms, all providers may perform very well on a given measure, but when compared to the local average, some providers have to be below the average. In this situation, you may need to rethink what comparison point you are using so that the display fairly and accurately represents the performance of the providers.

**Example:  
Word icons used in the California HealthCare  
Foundation's report on hospital quality**

	Hospital performed well above average compared to other hospitals on this measure.
	Hospital performed better than average compared to other hospitals on this measure.
	Hospital performed within the average range compared to other hospitals on this measure.
	Hospital performed worse than average compared to other hospitals on this measure.
	Hospital performed well below average compared to other hospitals on this measure.
	Hospital performance has not been rated because there are no nationally agreed upon guidelines for rating this measure.

Source: [www.CallHospitalCompare.org](http://www.CallHospitalCompare.org)



### Applying this strategy: A “before and after” example

This example illustrates how word icons can replace symbols in a display of measures of patient experience with hospital care.

**Before:** For each hospital, relative performance on a patient experience measure is represented by an empty circle, a half-filled circle or a filled circle.

**Patients' Experiences with Hospital Care**

● Above Average  
◐ Average  
○ Below Average

Hospitals	Cleanliness	Discharge Information	Pain Control	Quiet at Night	Timely Help from Staff
Blue Harbor Medical Center	◐	●	●	◐	●
Dearville Hospital	●	◐	◐	●	○
Good Samaritan Health Center	○	○	◐	○	○
Greenway Family Hospital	◐	○	○	◐	●
Hillside Hospital	◐	◐	◐	●	◐
Irving Medical Center	●	◐	●	●	●
Parkview Regional Hospital	●	●	◐	●	◐

**After:** For each hospital, relative performance on the measures is represented by a word icon.

**Patients' Experiences with Hospital Care**

Hospitals	Cleanliness	Discharge Information	Pain Control	Quiet at Night	Timely Help from Staff
Blue Harbor Medical Center	average	better	better	average	better
Dearville Hospital	better	average	average	better	below
Good Samaritan Health Center	below	below	average	below	below
Greenway Family Hospital	average	below	below	average	better
Hillside Hospital	average	average	average	better	average
Irving Medical Center	better	average	better	better	better
Parkview Regional Hospital	better	better	average	better	average

## Helping Users Limit the Number of Providers They Compare

### What's the idea?

Many quality reports address the challenges of information overload by limiting the number of providers whose performance can be displayed at the same time. In this common strategy, a Web site typically requires the user to specify a set of three to five providers and then shows quality scores for those providers only. This approach, similar to letting users limit the number of measures they can see at the same time, is a common strategy in Web-based quality reports.

### Why do it?

This strategy is an easy way to help users focus their attention on the providers who interest them and ignore information about other providers. The site may have quality scores for a large number of entities, but the users are able to focus on just the information that is relevant to them.

In the context of health plans and even hospitals, depending on the community, the number of choices is usually not a significant barrier for users of quality information. But in the context of medical groups and especially individual physicians, the number of choices can make it very difficult for users to take in and interpret the information. When faced with a long list of providers, particularly with multiple quality scores, users are hard-pressed to identify differences, let alone patterns, in performance that would help them tell which are better and which are worse.

### Implementation considerations

The capabilities of Web sites have made it easy to implement this strategy, which could not be done on paper. What is challenging about this strategy is giving users a meaningful way to select the providers. Most quality reports ask users to choose providers without

<b>Strategy: Helping Users Limit the Number of Providers</b>	
<b>Goal Achieved:</b>	
✓	Makes It Easier To Identify and Understand Patterns
✓	Helps Users Focus on Topics or Providers of Interest
	Reduces Amount of Information for Users

### Example: The Greater Detroit Area Health Council's report on hospital performance

WELCOME to the Save Lives Save Dollars Health Care Performance Report. This report provides information on the quality of care provided at hospitals in southeastern Michigan. To begin your search, click on a county below.

Steps 1 CHOOSE REPORT 2 CHOOSE HOSPITALS 3 VIEW REPORT

**BASIC INFORMATION**

**Search By County**

All Counties  
 Livingston  
 Macomb  
 Monroe  
 Oakland  
 St. Clair  
 Washtenaw  
 Wayne

**Search By Zip Code**

Zip or Town: State: MI

Within: 20 miles

Continue

Source: [http://mycarecompare.org/site/reports.php?s=hospitals&v=hospital\\_performance\\_report](http://mycarecompare.org/site/reports.php?s=hospitals&v=hospital_performance_report)

offering any information except geographic proximity. In some parts of the country, that may be sufficient; in many others, proximity does not help to narrow the possibilities. Or proximity may not be a priority relative to other concerns, such as weekend appointments or expertise in chronic care. Without any additional information, the user's initial list could be based on suggestions from family or friends, driven by location, or completely random.

**Tactics for improving the starting point for users include the following:**

**Providing more information about the practice.** Information that could help users make informed choices among physicians' offices includes practice characteristics, such as hours, languages spoken, and the availability of electronic communication. Whether a provider is included in the user's health plan's network is also a real constraint for many people. While there may be some value to seeing how in-network providers compare to others, people who need to choose a new doctor, for example, are most interested in the doctors who are actually available to them. At this time, most consumers have to consult a different source for that information. Getting, maintaining, and incorporating information on health plan networks is a significant challenge to making this strategy more useful.

**Providing a summary measure of quality.** You can take this approach one step further by giving users both more information about the practice as well as a little information about quality so that they can factor that information into the first round of the choices. This approach, for example, would allow a user to replace a random selection of nearby physicians with a selection based on identifying nearby physicians with Saturday hours and high patient experience scores.

**Example:  
Massachusetts Health Quality Partners' report  
on the clinical quality of medical groups**

quality reports : clinical quality : medical group performance

QUALITY INSIGHTS: CLINICAL QUALITY IN PRIMARY CARE

Begin By Selecting Massachusetts Medical Groups...

**By distance from a particular zip code:**  
Find medical groups within  
5 miles of zip code:

**By name of a medical group:**  
Enter medical group name:

**By name of a doctors' office:**  
Enter doctors' office name:

**By name of a doctor:**  
Enter doctor's last name:






Source: <http://www.mhqp.org/quality/clinical/cqSearch.asp?nav=032460>

### Applying this strategy: A “before and after” example

This example illustrates one way to enable users of the report to control the number of providers for whom they see comparative information. In this example, users can limit the list by geography as well as by the level of performance on the quality score.

**Before:** For each physician practice, the user can see the distance from home and the numerical score for an asthma measure.






Asthma Care

Doctors' Offices	Distance	Score
Addison Internal Medicine	3.0 mi	 62%
Blue Harbor Community Health Center	9.0 mi	 90%
Hernandez Health Association	15.2 mi	 83%
Hillside Associates	19.9 mi	 92%
Irving Medical Center	4.4 mi	 76%

**After:** The user has limited the list to practices that are within 10 miles and have above average scores on the measure of asthma care.

Asthma Care

Distance: Less than 10 mi of Zip Code: 12345      Score:  Above Average    Average    Below Average

Doctors' Offices	Distance	Score
Robert Park, MD and Associates	9.3 mi	 96%
Blue Harbor Community Health Center	9.0 mi	 90%
Lement Family Practice	1.0 mi	 89%
Wilkinson Center	3.3 mi	 80%
Irving Medical Center	4.4 mi	 76%

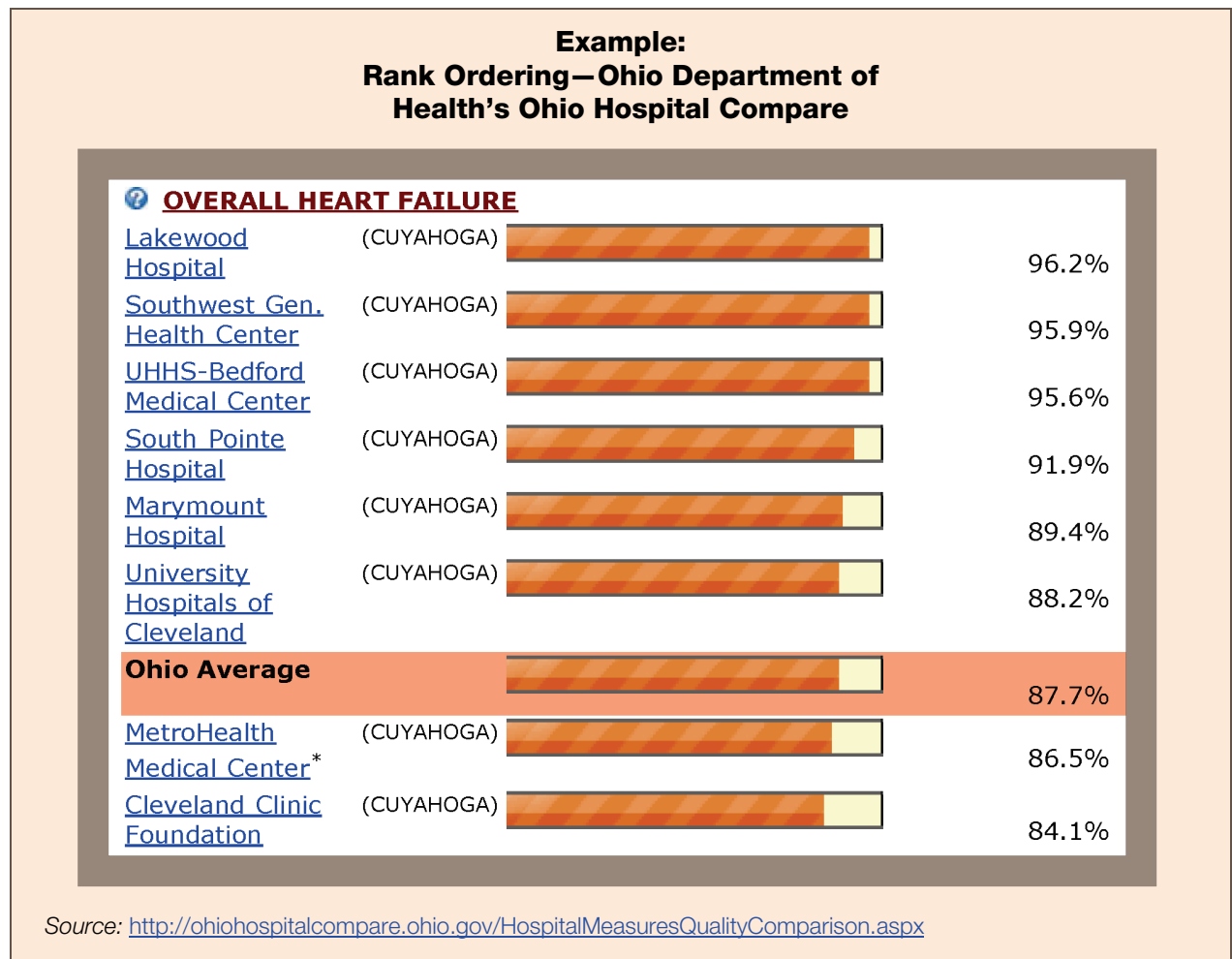
## Rank Ordering and Tiering

### What's the idea?

**Rank ordering** refers to the strategy of presenting providers in order of performance. Sometimes this is done by allowing users to sort providers by their performance on specific measures.

Tiers are essentially lists of providers by performance category. Tiers are different than rank ordered lists in that the tiers do not make a distinction between providers whose performance is similar. For example, on a given quality measure, providers whose scores put them in the top 10th percentile may be listed together as “Best,” providers whose scores are between the 10th and 40th percentiles may be listed together as “Better,” and so on.

Strategy: Rank Ordering and Tiering	
Goal Achieved:	
✓	Makes It Easier To Identify and Understand Patterns
✓	Helps Users Focus on Topics or Providers of Interest
	Reduces Amount of Information for Users



As a display strategy, tiers are related to symbols and word icons because providers are separated into categories, but the presentation of the information is different. With tiers, users see lists of all providers that qualified for a given category. With symbols and word icons, users see what

the category is for each individual provider. For an example of tiers in a data display, see the “Before and After” example on pages 27.

## Why do it?

When providers are listed in rank order or in tiers, users are able to see quickly which ones are best and which are worst. Ordering enables users to interpret the data more efficiently (“a score of 89 puts this practice in the top five for this measure”) and detect patterns (“this practice is consistently in the top five across all measures”). The ability to list providers in order of performance on given measures also gives users a way to apply their priorities. A user, for example, might hone in on the top five providers on a specific measure and then look at their performance on other measures.

Tiers are also a way to recognize strong performers by listing them by name rather than relying on users to interpret the information to determine how providers are performing relative to each other. This strategy also avoids the implication that minor differences in performance are meaningful.

Finally, rank ordering and tiering are familiar ways of presenting information on the relative performance of entities. People are accustomed to seeing ordered lists for colleges, cars, mutual funds, and health care providers in media such as *U.S. News & World Report*.

## Implementation considerations

From a technical perspective, rank ordering is easy to do. Grouping providers in tiers faces the same challenges as symbols and word icons because the strategy requires deciding where to draw the line between performance categories.

Both rank ordering and tiering reveal information about the relative performance of providers that would otherwise require significant effort on the part of users; this can pose a challenge if some providers do not welcome this kind of clarity. But there is growing acceptance for this approach.

**Choosing the option that best suits the data.** Listing providers in rank order may be easy, but the clarity of rank ordering can be misleading—and unfair to providers—if the differences in provider performance are not statistically or substantively significant. A real difference may not exist between the providers listed as #1 and #7. Grouping providers in tiers is one way to address this issue.

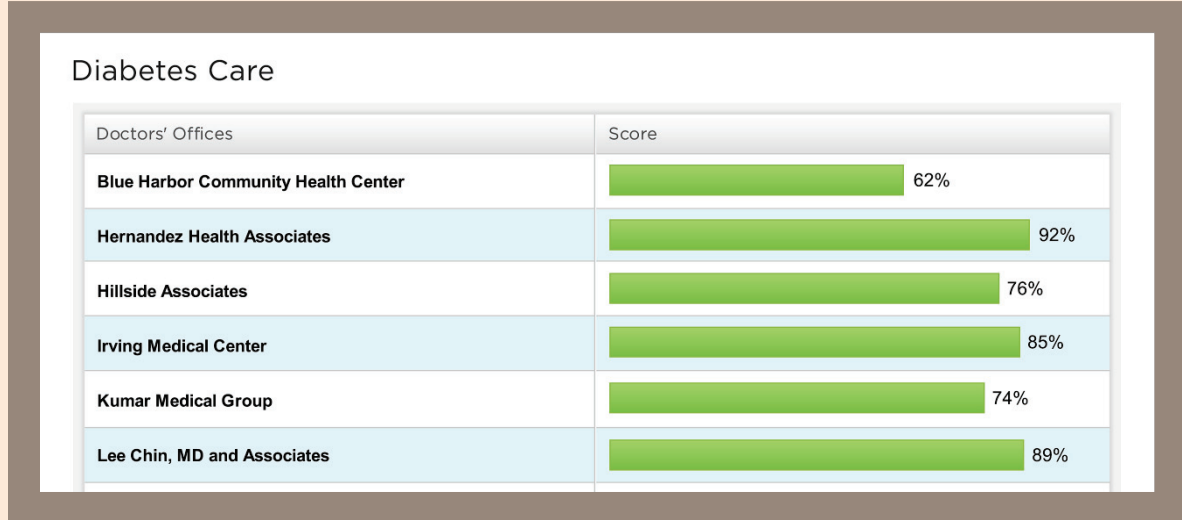
**Providing users with ways to keep track of specific providers.** When multiple measures are reported, the display itself can be a challenge because it is hard for users to find specific providers in a list that changes every time they choose to sort by performance on a given measure. One visual tactic for overcoming this challenge is to give users a way to highlight specific providers so they are easy to find in the list.

Finally, while rank ordering and tiering can reveal some patterns in performance, they do not always accomplish this goal. When the performance of providers varies across measures and users have to look for provider names across multiple lists, it can be difficult for the users to detect any patterns.

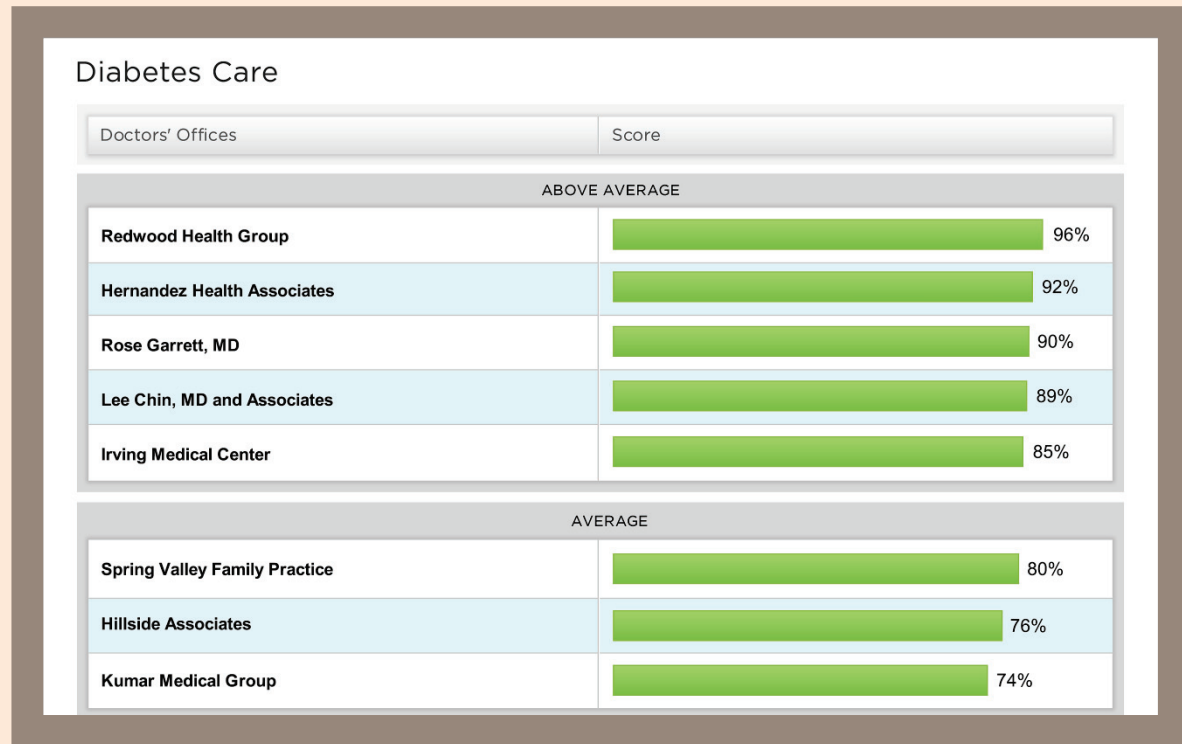
### Applying this strategy: A “before and after” example

This example illustrates how numerical scores for a diabetes measure can be displayed in tiers.

*Before:* For each physician practice, the user can see the numerical score for a diabetes measure.



*After:* The physician practices are displayed in groups based on their performance relative to the average. Within each group, the practices are listed in order of performance, but they could be displayed alphabetically as well.





## Quality Framework

### What's the idea?

A quality framework is a model for organizing quality measures in a report by grouping them into categories that communicate what quality of care is, e.g., effective, safe, and patient-focused. This approach reinforces the meaning and the key characteristics of health care quality. At the same time, it reduces the burden on the user to figure out what individual measures mean.

Strategy: Quality Framework	
Goal Achieved:	
✓	Makes It Easier To Identify and Understand Patterns
✓	Helps Users Focus on Topics or Providers of Interest
	Reduces Amount of Information for Users

### Why do it?

The primary reason to use a framework for reporting on quality is to give consumers a way to understand why quality measures and scores matter. This framework helps people see the bigger picture of performance categories and how individual measures can combine to tell them something more general about care. In the first illustration of a quality framework above, for example, they can see that one of the doctors is good at keeping patients safe but not as good at focusing on patients' needs.

**Example:  
A quality framework with three categories**

Doctor	<u>Effective</u> Uses treatments proven to get results		<u>Safe</u> Uses safeguards to protect patients from medical errors		<u>Patient Focused</u> Responsive to patients' needs and preferences	
	Uses best practices for treating chronic illness	Uses best practices for screening for diseases	Has procedures to prevent medication errors	Has a system to prevent lab results from getting lost	Communicates well with patients	Spends enough time with patients
	Dr. Allard	average	average	<b>better</b>	<b>better</b>	average
Dr. French	<b>below</b>	average	<b>better</b>	average	<b>below</b>	<b>below</b>
Dr. Cain	average	average	<b>below</b>	<b>below</b>	<b>better</b>	average
Dr. Emory	<b>better</b>	<b>better</b>	average	average	average	average
Dr. Castle	average	average	average	average	<b>better</b>	<b>better</b>

**better** = scored above average     
 average = scored average     
 **below** = scored below average

*Source:* Hibbard JH, Greene J, Daniel D. What is quality anyway? Performance reports that clearly communicate to consumers the meaning of quality of care. Medical Care Research Review. 2010; 67: 275–293.


The use of a quality framework also addresses several of the challenges that are common to quality reports:

**Users need help with the concept of quality.** Consumers often do not think about quality in the way it is typically measured and reported by health care professionals (e.g., as “process” and “outcomes”). By using and explaining terms that are more familiar and understandable to consumers, this framework helps them understand the concept of quality. Educational theory suggests that if you give people the big ideas first, they will be able to integrate the smaller ideas more easily.

**Users often do not understand individual measures or why they matter.** Giving consumers a large number of different quality indicators is counterproductive when they don’t understand how those indicators relate to quality. A controlled study by Hibbard and colleagues found that providing users of a quality report with the three-category framework of “effective, safe, and patient-focused” increased comprehension and the perceived value of quality information (as compared to those who got no framework).<sup>8</sup> At the same time, the framework reduced the need for users to process the meaning of individual indicators because they could rely on the framework categories.

**Users do not know what to look at first.** A framework can help users identify and focus on the topics that are most important to them. If effectiveness of care, for example, is a user’s highest priority, the user can easily tell which measures to consider and then “drill down” to the next layer of information (e.g., the use of best practices for chronic conditions) to see more details.

**Example:  
Massachusetts General Hospital’s  
Quality and Safety Web site**



The screenshot shows a web page titled "Performance Reports" with four main categories, each with a brief description and a link to see the full list of measures:

- Delivering the Right Care**: Measures of how often MGH adheres to guidelines and provides recommended care for patients with certain conditions and health care needs: heart attack, heart failure, pneumonia, and surgery. » See full list of measures
- Keeping Patients Safe**: Measures of MGH's efforts to reduce potentially avoidable risks for patients. » See full list of measures
- Listening to Patients**: Measures of patients' experiences at the MGH. » See full list of measures
- Providing Equitable Care**: Measures of MGH's success at providing unbiased care across patients of different races, ethnicities, and languages.

Source: MGH Quality and Safety Web site: <http://qualityandsafety.massgeneral.org>

<sup>8</sup> Hibbard JH, Greene J, Daniel D. What is quality anyway? Performance reports that clearly communicate to consumers the meaning of quality of care. *Medical Care Research Review*. 2010; 67: 275–293.

## Implementation considerations

**Using an quality framework appropriate for your Alliance’s measures.** When report sponsors have measures that cross multiple domains of quality, it is important to confirm whether the categories in the framework truly represent those measures.

This is especially challenging when you have a small number of specific measures (e.g., two measures of preventive care screenings). Although a framework may help users understand those measures as part of “effective” care, you wouldn’t want to encourage users to conclude that a provider offers highly effective care because of strong performance on just those two measures.

**Using a framework when measures don’t address multiple domains of quality.** The implementation of a quality framework in a comparative report depends in large part on the nature and number of the measures being reported. In the absence of measures that can be sorted into two or more categories, a quality framework is still feasible—but the benefits are limited to helping users understand that quality has multiple domains and creating some pressure for information in the missing categories.

**Assigning measures to categories.** While many quality measures fit neatly into the three-category framework, it can be difficult to determine the best category for some measures. Measures of the adoption of health information technology, for example, could be regarded as contributing to the safety, effectiveness, or patient-centeredness of care.

### Applying this strategy: A “before and after” example

This example illustrates how the quality framework could replace a condition-oriented grouping of quality measures.

**Before:** For each physician practice, the user can see summary scores in a long list of categories, most but not all of which are conditions.

Quality of Medical Groups

	Hillside Associates	Carlson Clinic	Aura Practice
<b>Asthma</b>	better	average	better
<b>Breast Cancer Screening</b>	average	better	average
<b>Bronchitis</b>	average	below	average
<b>Cervical Cancer Screening</b>	below	below	below
<b>Childhood Immunization</b>	better	average	average
<b>Chlamydia Screening</b>	better	average	better

**After:** The measures are grouped into subtopics within the quality framework of “Effective, Safe, and Patient-Focused.” Users would click on the subtopics to see the score for condition-specific and other more detailed measures.

Quality of Medical Groups

Category	Hillside Associates	Carlson Clinic	Aura Practice
<b>Effective</b> Uses treatments proven to get results			
<a href="#">Using Best Practices in Chronic Care</a>	better	average	average
<a href="#">Screenings and Immunizations</a>	better	below	better
<b>Safe</b> Uses safeguards to protect patients from medical errors			
<a href="#">Avoiding Prescription Errors</a>	better	better	below
<a href="#">Avoiding Lost Lab Results</a>	below	average	below
<b>Patient-Focused</b> Responds to patients' needs and preferences			
<a href="#">Providing Care When Needed</a>	average	better	below
<a href="#">Patient Experience With Care</a>	average	below	average

## Composite Measures

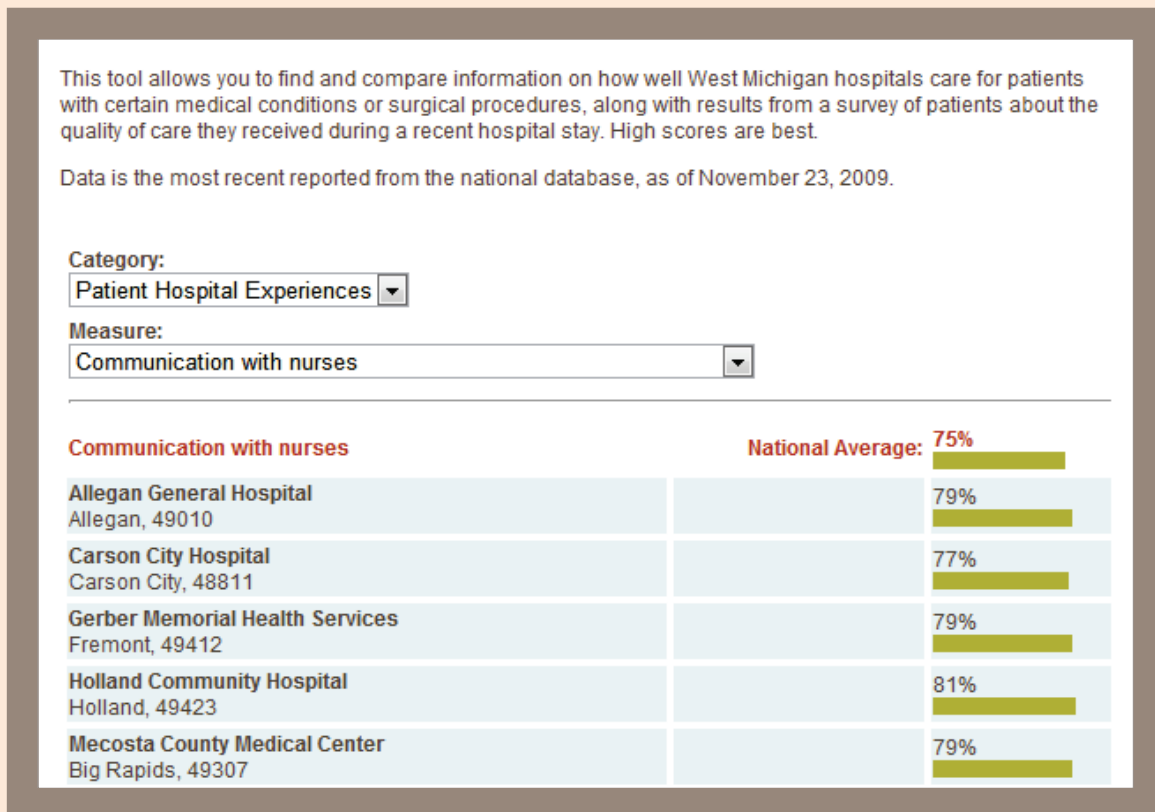
### What's the idea?

A composite measure combines two or more individual measures into one measure. The key distinction between composite measures and summary scores is that the composite measures are derived scientifically. Measure developers use consumer testing, input from experts, and statistical analyses (known as psychometric testing) to identify the individual measures that are highly related to each other conceptually and statistically. The measures included in a summary score, on the other hand, may have a limited or even no relationship. The conceptual relationship could be clinical in nature (e.g., there may be evidence that the measures capture related clinical processes) or based on consumers' feedback on how the measures assess a similar idea.

Strategy: Composite Measures
<b>Goal Achieved:</b> Makes It Easier To Identify and Understand Patterns ✓ Helps Users Focus on Topics or Providers of Interest ✓ Reduces Amount of Information for Users

### Example West Michigan

This table shows a report for a composite measure composed of three questions from the CAHPS Hospital Survey.



Source: [http://rethinkhealthy.org/rethink\\_hospital\\_compare.asp](http://rethinkhealthy.org/rethink_hospital_compare.asp)

The best known examples of composite measures are those reported for the *Consumer Assessment of Healthcare Providers and Systems* (CAHPS) surveys of patient experience, which include the CAHPS Hospital Survey, the CAHPS Clinician & Group Survey, and the CAHPS Health Plan Survey. The developers of those surveys tested the measures with consumers to identify the conceptual relationships among the items and to confirm understanding of each composite measure. They also used statistical testing to confirm that the survey items within each CAHPS composite measure are highly related.

### Example Minnesota HealthScores

This screenshot shows how Minnesota HealthScores displays a composite measure for diabetes care that reflects the percentage of patients with diabetes who achieved five goals (referred to as the “D5”).

Sort by Name		compare up to 3	
<b>Adult Medicine, PA</b>	St. Paul 55104	61%	<input type="checkbox"/>
<b>CentraCare - Becker</b>	Becker 55308	60%	<input type="checkbox"/>
<b>Allina Medical Clinic - Brooklyn Park</b>	Brooklyn Park 55443	59%	<input type="checkbox"/>
<b>Affiliated Community Medical Centers - Litchfield Clinic (East)</b>	Litchfield 55355	57%	<input type="checkbox"/>
<b>CentraCare - Internal Medicine River Campus</b>	St. Cloud 56303	53%	<input type="checkbox"/>

Source: [http://www.mnhealthscores.org/?p=our\\_reports&sf=clinic&search\\_phrase=&category=1&name\\_id=&compare=](http://www.mnhealthscores.org/?p=our_reports&sf=clinic&search_phrase=&category=1&name_id=&compare=)

## Why do it?

The main benefit of a composite measure is that it reduces the number of data points the user has to consider, which simplifies a data display and makes interpretation of the data more efficient for the user.

Relative to a summary score, a composite measure is easier to explain and justify to stakeholders because of its basis in research. Also, the relationship among the components means that efforts to improve in one component are likely to have a positive impact on multiple components.

## Implementation considerations

**Identifying existing composites to use.** Because the development of composite measures requires significant effort and resources, not many are available for use by the Alliances. In addition to the composite measures for the CAHPS surveys, the other well-established set of composite measures comes from the *Agency for Healthcare Research and Quality's* (AHRQ's) Quality Indicators, which are measures of clinical quality and safety in hospitals.

Alliances can learn more about these composite measures at the following sites:

- CAHPS: <https://www.cahps.ahrq.gov/default.asp>.
- AHRQ Quality Indicators: <http://www.qualityindicators.ahrq.gov/downloads.htm>.

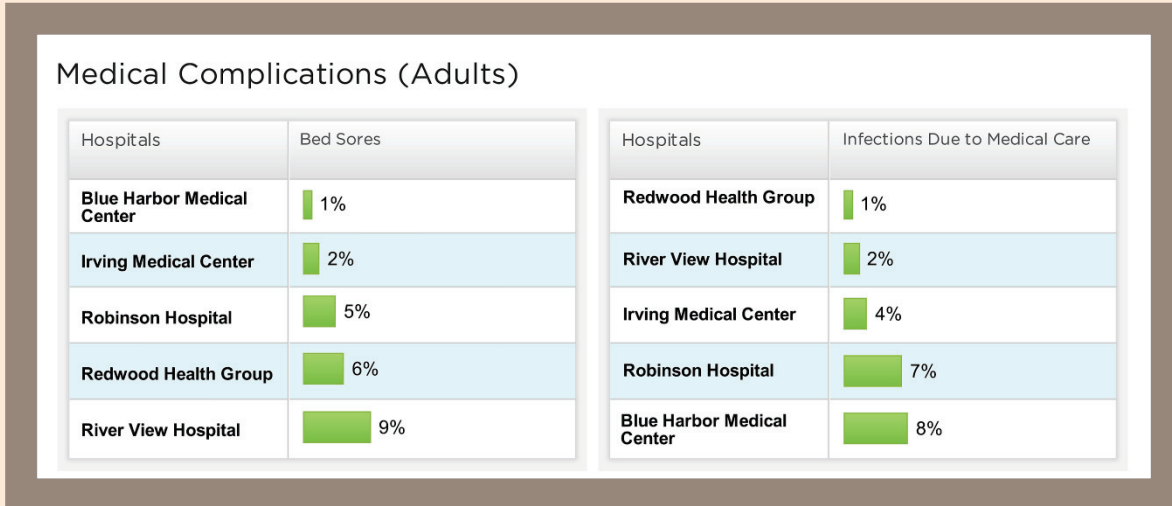
**Providing layers of information.** Reporters of composite measures have the option of allowing users to “drill down” to additional layers of scores for individual indicators. However, while this level of detail is feasible, it is not advisable if it burdens users with a level of detail they don't want. Scores for individual items in a survey, for example, are often not useful to consumers, even though they can be helpful to providers seeking to understand how to improve their care. When detailed information is helpful to stakeholders but potentially confusing or overwhelming for consumers, it may be better to find other ways to provide the stakeholders with that level of information. Testing with consumers can help you determine whether layered information would be valuable for your audience.



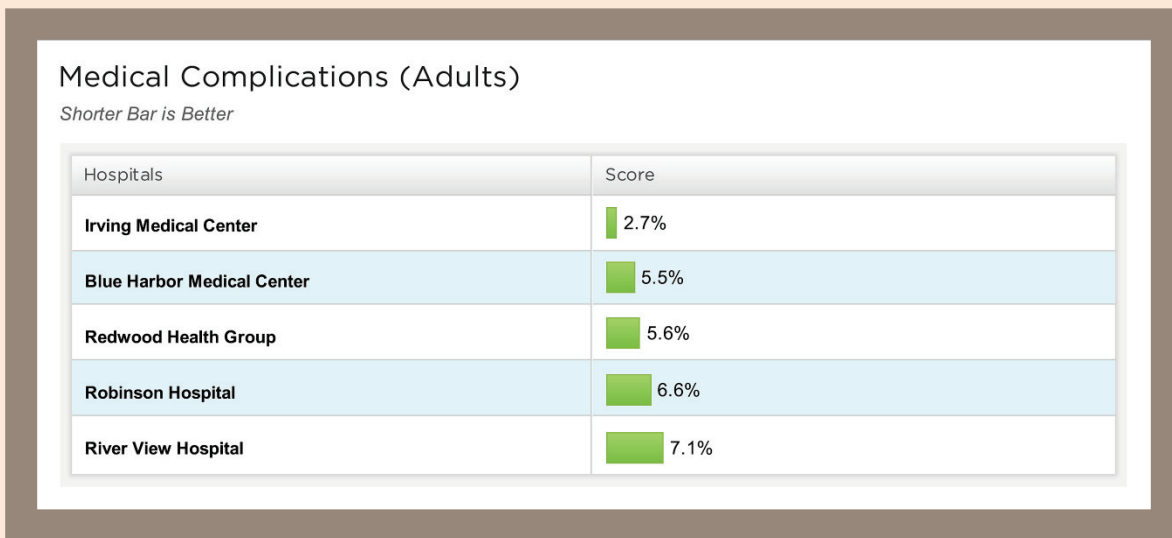
### Applying this strategy: A “before and after” example

This example illustrates the use of a composite measure to replace multiple individual measures.

**Before:** For each of the 11 measures of medical complications, the user sees the score for every hospital. This example shows just 2 of the 11 measures in this composite from the AHRQ Quality Indicators.



**After:** The display collapses the 11 measures into one composite measure for medical complications. Users could choose to see the individual measures after reviewing the composite scores.



## Summary Scores

### What's the idea?

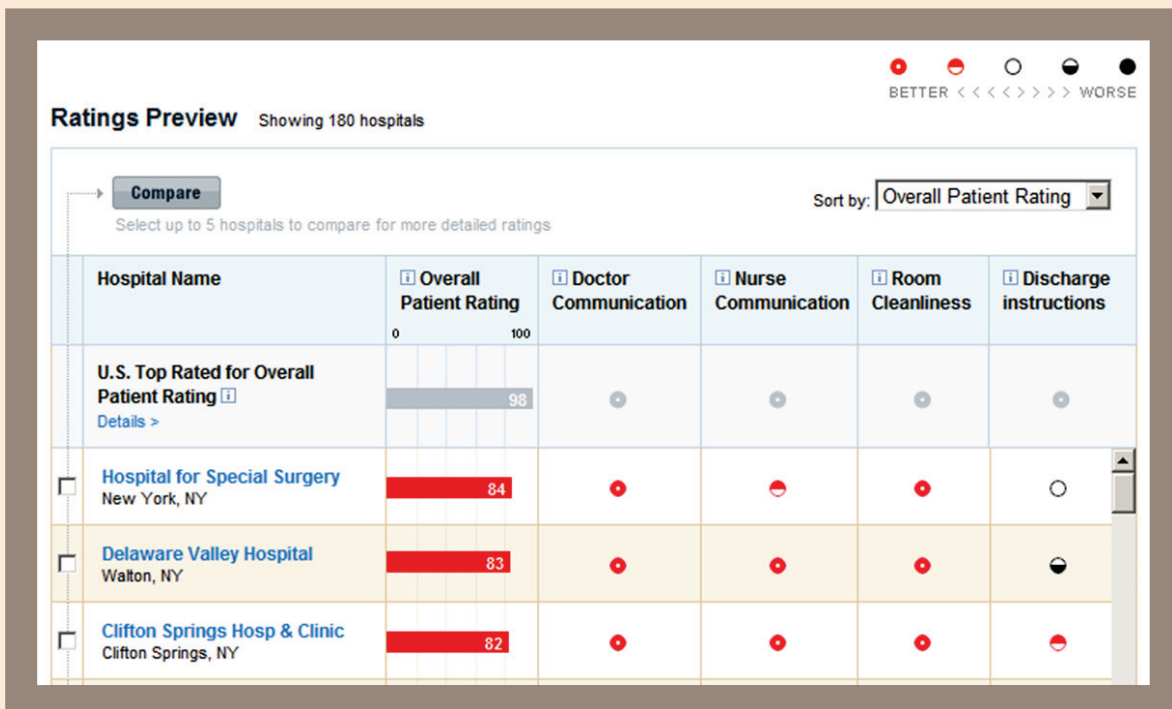
Like a composite measure, a summary score combines multiple measures into a single score. However, the measures are not highly related to each other conceptually or statistically. The only thing they have in common is that they are measuring the quality of a particular type of entity—such as hospitals, physician groups, or health plans.

A summary score can include several different kinds of measures (e.g., outcomes and processes; patient experience and patient safety). A summary score can cover all the bases, all measures for a given condition, or all measures within a domain of quality (such as safety). In most cases, after reviewing summary scores, users can choose to drill down to a second or even third layer for more specific information.

Strategy: Summary Scores
<p><b>Goal Achieved:</b></p> <ul style="list-style-type: none"> <li>Makes It Easier To Identify and Understand Patterns</li> <li>Helps Users Focus on Topics or Providers of Interest</li> <li>✓ Reduces Amount of Information for Users</li> </ul>

### Example *Consumer Reports' Consumer Health Ratings site*

*Consumer Reports* analyzed data from Hospital Compare to develop an overall rating that combines scores from multiple survey composites. This rating is not one of the items from the survey.



Source: <http://www.consumerreports.org/health/doctors-hospitals/hospital-ratings/ratings/search-results.htm?state=NY> (available to subscribers only)

## Why do it?

The biggest advantage of a summary score is that it satisfies the demand from consumers for an overall “grade” for a hospital or a doctor. Consumers are accustomed to seeing overall ratings for other services and products in other industries, such as automobiles and restaurants.

The simplicity of a handful of scores—or even just one—is especially appealing to people who are just beginning to look at quality information as well as for those who do not have a diagnosis that makes them interested in more detailed information. This defines most of the potential audience for a quality report.

Because of the very limited number of data points, a summary score also helps people quickly grasp who is doing better than others and who is doing worse. There is little room for ambiguity.

## Implementation considerations

Although a summary score has much appeal, applying this strategy is not a simple decision. It requires overcoming a few challenges:

**Making sure the individual measures are adequate to the task.** The quality measures you can report may not be sufficient to represent a larger domain of quality in a summary score. Suppose, for example, you have data for three measures of preventive care for medical practices: breast cancer screening, cervical cancer screening, and childhood immunizations. Those measures alone would not be sufficient to calculate a “Prevention” summary score that truly represents how well those practices deliver preventive services. Because everyone is measured by the same metric, the comparison would be fair. But the summary score would be misleading because the measures do not address preventive care for all subpopulations (adult men are left out in this case) and the measures cover only a small subset of all preventive health services.

**Devising an acceptable methodology for combining measures into a single score.** Because a summary score does not necessarily mix “like” measures, you have to be careful about developing a methodology for combining the scores for diverse measures in a way that is logical, statistically defensible, and fair. Whether and how you “weight” the individual measures differently is a difficult question: Should the summary score give the same weight to every individual measure or treat the measures as if some are more important than others? Assuming that composite measures should have greater weight than individual measures when combined into one score, what proportions are appropriate? There is no consensus among experts on how to handle weightings of this sort.

Whatever methodology is chosen, it is important to share the approach with providers and other stakeholders to get their buy-in. In developing a summary score for the CAHPS Hospital Survey, *Consumer Reports* tested multiple ways to combine measures, using both statistical analysis and input from experts; the publication was careful to make sure the method would be defensible.

**Providing access to more specific information.** One downside of providing a summary score is that it may hide performance on specific measures that is either very poor or very strong. A hospital could have a high summary score, for instance, but weak scores in a specific clinical area. To address this possibility, reports can offer a second layer of information for people who wish to look at more detailed measures.






### Applying this strategy: A “before and after” example

This example illustrates the use of a summary score to replace multiple individual measures.

**Before:** For each of the nine measures for pneumonia care in hospitals (as of 2008), the user sees a numerical score for every hospital.

Hospitals	Assess Oxygen Level	Pneumonia Vaccine	Blood Test Before Antibiotics	Smoking Cessation Advice	Antibiotics Within 6 Hours	Blood Test Within 24 Hours	Influenza Vaccine	Antibiotic ICU	Antibiotic non-ICU
<b>Blue Harbor Medical Center</b>	100%	100%	97%	76%	100%	100%	100%	100%	100%
<b>Dearville Hospital</b>	94%	91%	95%	89%	94%	91%	94%	91%	91%
<b>Good Samaritan Health Center</b>	100%	85%	89%	99%	100%	85%	100%	85%	85%
<b>Greenway Family Hospital</b>	100%	87%	99%	99%	100%	87%	100%	87%	87%
<b>Hillside Hospital</b>	100%	91%	96%	85%	100%	91%	100%	91%	91%
<b>Irving Medical Center</b>	99%	84%	87%	94%	99%	84%	99%	84%	84%
<b>Parkview Regional Hospital</b>	98%	90%	88%	99%	98%	90%	98%	90%	90%
<b>Redwood Hospital</b>	98%	89%	92%	97%	98%	89%	98%	89%	89%

**After:** The display summarizes the scores for the nine measures into one summary score for pneumonia care. Users could choose to see individual scores after reviewing the summary score.

Hospitals	Pneumonia Care
<b>Blue Harbor Medical Center</b>	average
<b>Dearville Hospital</b>	 better
<b>Good Samaritan Health Center</b>	 below
<b>Greenway Family Hospital</b>	average
<b>Hillside Hospital</b>	average
<b>Irving Medical Center</b>	 better
<b>Parkview Regional Hospital</b>	 better
<b>Redwood Hospital</b>	 below

## What's the Bottom Line?

Regardless of what data you are working with, there is always a way to apply the strategies in this guide—alone or in combination—to make it easier for consumers, providers, and other health care professionals to understand and use the information.

To determine how you can improve the display of information you have, start by identifying what you can do to achieve the following objectives:

**Context:** How can you help users understand the “big picture” of quality and the meaning of individual measures? When possible, try to organize measures into a quality framework to provide that kind of context.

**Clarity:** How can you provide data in a way that leaves little room for ambiguity? Display strategies that communicate relative performance, such as symbols and especially word icons, help users to see quickly the meaningful differences in performance.

**Brevity:** How can you condense the amount of information people see at one time? Summary scores and composite measures give users information in digestible portions, with the option of more details in another layer of information.

**Ease of use:** How can you make it easy for people to draw conclusions and determine which provider is best for them? When multiple measures are being reported, you will need a combination of display and search strategies to make it easy for people to focus on what's important to them and interpret that information appropriately and accurately. Examples of useful combinations include:

- Summary scores or composite measures displayed in the context of a quality framework, with word icons indicating the relative level of performance (possibly as a first layer, with more details available).
- Bar charts with a comparison point, listed in rank order or tiers (possibly as a second layer of details).
- A user-limited list of providers with the option to sort the list by order of performance on one or more measures.

Consider also how the display strategies you choose fit with the architecture of your Web site, because it is critical for them to work together. Using search techniques to narrow the list of providers is an example of how Web architecture can be part of a display strategy.

- If you are creating a new site, what are the implications of your display strategy for the architecture of the site?
- If your site is already established, in what ways does its structure limit or shape how you can display information, and to what extent can it be changed?
- If you are planning to add new measures, health conditions, or settings of care to the site, how will that affect your display strategy?

## Where You Can Learn More

The AF4Q Web site (<http://forces4quality.org>) offers Alliances a number of resources related to the public reporting of quality information. Additional resources include the following:

- **TalkingQuality.** The TalkingQuality Web site at [www.TalkingQuality.ahrq.gov](http://www.TalkingQuality.ahrq.gov) is a free and comprehensive resource for the many organizations that are developing comparative quality reports for consumers. Sponsored by AHRQ, TalkingQuality covers the steps involved in a quality reporting project:
  - Planning the project
  - Choosing appropriate measures
  - Deciding how to display and describe quality information
  - Promoting and distributing the report
  - Evaluating the project

In addition to tips on writing, designing, and testing quality reports, TalkingQuality offers several useful features:

- **Make the Case for Consumer Reporting** supplies the arguments and citations you may need to convince others of the merits of comparative quality reports: <https://www.talkingquality.ahrq.gov/content/tools/makeacase.aspx>.
- The **Health Care Report Card Compendium** is a searchable database of about 200 reports. You can use the Report Card Compendium to see what other organizations are reporting and what strategies they are using to display information: <https://www.talkingquality.ahrq.gov/content/reportcard/search.aspx>.
- **Your Project Checklist** can help you plan a reporting project, educate your team, document decisions, and track your progress: <https://www.talkingquality.ahrq.gov/content/tools/workbook.aspx>.
- A **searchable bibliography** helps you find articles and other resources cited in TalkingQuality: <https://www.talkingquality.ahrq.gov/content/resources/BibliographySearch.aspx>.
- **Best practices in public reporting:** This report, by Judy Hibbard and Shoshanna Sofaer, is published by AHRQ and includes three parts:
  - **How To Effectively Present Health Care Performance Data to Consumers:** <http://www.ahrq.gov/qual/pubrptguide1.htm>
  - **Maximizing Consumer Understanding of Public Comparative Quality Reports: Effective Use of Explanatory Information:** <http://www.ahrq.gov/qual/pubrptguide2.htm>

- **How To Maximize Public Awareness and Use of Comparative Quality Reports Through Effective Promotion and Dissemination Strategies:**  
<http://www.ahrq.gov/qual/pubrptguide3.htm>
- **The Informed Patient Institute (IPI):** The IPI maintains a Web site for consumers that grades hundreds of online report cards based on their content, timeliness, presentation, ease of use, and decision support: <http://www.informedpatientinstitute.org>.
- **Communication Toolkit:** A collection of free health care quality communication materials about evidence-based health care and getting high quality care is at: <http://businessgrouphealth.org/usinginformation/>.
- **Key Research articles.**
  - Carman KL, Maurer M, Yegian JM, Dardess P, McGee J, Evers M, Marlo KO. Evidence that consumers are skeptical about evidence-based health care. *Health Affairs (Millwood)*. 2010 June 3. Available at <http://content.healthaffairs.org/cgi/content/full/hlthaff.2009.0296v1>.
  - Hibbard JH. What can we say about the impacts of public reporting: inconsistent execution yields variable results. *Annals of Internal Medicine*. 2008 January. 148(2), 111–123.
  - Hibbard JH, Greene J, Daniel D. What is quality anyway? Performance reports that clearly communicate to consumers the meaning of quality of care. *Medical Care Research Review*. 2010. 67, 275–293.
  - Hibbard JH, Peters EM. Supporting informed consumer health care decisions: data presentation approaches that facilitate the use of information in choice. *Annual Review of Public Health*. 2003. 24, 413–433.
  - Hibbard JH, Stockard J, Tusler M. It isn't just about choice: the potential of a public performance report to affect the public image of hospitals. *Medicare Care Research and Review*. 2005. 62(3), 358–371.
  - Hibbard JH, Stockard J, Tusler M. The long-term effect of public performance reporting on hospital quality improvement, market share, and reputation: evidence from a controlled experiment. *Health Affairs*. 2005 July/August. 24(4), 1150–1160.
  - Lidwell W, Holden K, Butler J. *Universal Principles of design: 100 ways to enhance usability, influence perception, increase appeal, make better design decisions, and teach through design*. 2003. Beverly, MA: Rockport Publishers, Inc.
  - Miller GA. The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychology Review*. 1994 April. 101(2), 343–352. Available at <http://www.musanim.com/miller1956>.



- Paulos JA. *Innumeracy: Mathematical illiteracy and its consequences*. New York: Hill and Wang. 2001.
- Peters EM, Hibbard JH, Slovic P, Dieckmann N. Numeracy skill and the communication, comprehension, and use of risk and benefit information. *Health Affairs*. 2007 May/June. 26(3), 741–748.
- Peters EM, Dieckmann N, Dixon A, Hibbard JH, Mertz CK. Less is more in presenting quality information to consumers. *Medical Care Research and Review*. 2007. 64(2), 169–190.
- Peters EM, Hibbard JH, Slovic P, et al. Numeracy skill and the communication, comprehension, and use of risk and benefit information. *Health Affairs*. 2007 May–June. 26(3), 741–748.
- Shaller D, Shaller Consulting. *Consumers in healthcare and quality of choice* (ISBN 1-932064-97-4). 2005 October. Oakland, CA: California HealthCare Foundation.
- Shaller D, Sofaer S, Findlay SD, Hibbard JH, Lansky D, Delbanco S. Consumers and quality-driven health care: a call to action. *Health Affairs*. 2003. 22(2), 95–101 (doi: 10.1377/hlthaff.22.2.95).
- Sofaer S, Firminger K. Patient perceptions of the quality of health services. *Annual Review of Public Health*. 2005. 26, 513–559.
- Tversky A, Kahneman D. Judgment under uncertainty: heuristics and biases. *Science*. 1974 September 27. 185(4157), 1124–1131.