

100 TOP HOSPITALS: NATIONAL BENCHMARKS 2009 STUDY

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INTRODUCING THE 100 TOP HOSPITALS: NATIONAL BENCHMARKS, 2009

Providing Valuable Performance Improvement Benchmarks for Hospital Leaders

For 17 years, the Thomson Reuters 100 Top Hospitals® program has provided hospital leaders with a valuable tool for performance improvement: a list of the top-performing hospitals in the nation and descriptions of the benchmarks they set. Our research identifies these hospitals objectively, by combining publicly available datasets with our empirical, time-tested methodologies. The winners raise the bar for hospital performance each year. This study benchmarks the industry's management and clinical outcomes to help hospital boards and executives ask the right questions about organizational performance and assess the effectiveness of their own strategies and execution.

Thomson Reuters identifies the award winners using the 100 Top Hospitals National Balanced Scorecard.¹ This scorecard enables us to recognize 100 hospitals that demonstrate balanced excellence throughout the organization and reliably deliver high value to the patients and communities they serve. These hospitals provide the highest quality care in the most efficient manner, maintain top financial stability, and elicit the highest patient perception of care.

SETTING NEW STANDARDS

The 100 Top Hospitals® award winners are true leaders in the industry. Year after year, the objective data we assemble for the 100 Top Hospitals studies yield numerous examples of excellence in clinical care, patient perception of care, operational efficiency, and financial stability, as evidenced in a number of published studies.²⁻¹⁸ For their competitors and peers, the winners offer a valuable example to follow. The findings presented in this document give hospital leaders benchmarks for

targeting top performance — by showing what the top performers have achieved, we offer concrete goals for the entire industry.

This year, our estimates found that if all Medicare inpatients received the same level of care as those in the 100 Top Hospitals winners across all categories:

- **More than 98,000 additional patients would survive each year.**
- **More than 197,000 patient complications would be avoided annually.**
- **Expenses would decline by an aggregate \$5.5 billion a year.**
- **The average patient stay would decrease by half a day.**

If the same standards were applied to all inpatients, the impact would be even greater. You can find more details about how the 100 Top Hospitals are outperforming their peers in the Findings section of this document.

INNOVATING PERFORMANCE EVALUATION

Thomson Reuters constantly strives to add value and relevance to our 100 Top Hospitals studies. Recent enhancements to the research include:

- The 100 Top Hospitals Performance Matrix — an executive-level scorecard that objectively measures leadership effectiveness, the success of organizational improvement strategies, and impact of executive decisions. This tool provides a visual and data-rich two-dimensional measure of relative long-term improvement and current performance compared with national peers.

- Customized, scalable Performance Matrices — views of hospital performance in health systems, states, markets, and insurance networks that allow executives to assess the value they are delivering to communities, the public, and subscribers.
- The addition of extended outcome measures. To help round out our balanced scorecard in the area of clinical excellence, we added a new domain to the National Benchmarks study this year. The first two 100 Top Hospitals extended outcome measures are 30-day mortality and 30-day readmission rates, as defined by the Centers for Medicare and Medicaid Services (CMS) Hospital Compare dataset. Quality hospital care extends beyond a patient's early hospital stay. These measures help us understand if a hospital is doing its best to prevent complications, educate patients at discharge, and make sure its patients make a smooth transition to their homes or another setting when they are discharged.
- 100 Top Hospitals: Cardiovascular Benchmarks study, identifying hospitals that demonstrate the highest performance in hospital cardiovascular services.
- 100 Top Hospitals: Health System Quality/Efficiency Benchmarks, a groundbreaking study, introduced in 2009, that provides an objective measure of health system performance as a sum of its parts.
- A variety of custom benchmark reports designed to help executives understand how their performance compares with their peers.

You can read more about these studies, and see lists of all winners, by visiting www.100tophospitals.com.

ABOUT THOMSON REUTERS

Thomson Reuters is the world's leading source of intelligent information for businesses and professionals. We combine industry expertise with innovative technology to deliver critical information to leading decision makers in the financial, legal, tax and accounting, healthcare and science and media markets, powered by the world's most trusted news organization. With headquarters in New York and major operations in London and Eagan, Minnesota, Thomson Reuters employs more than 50,000 people and operates in over 100 countries. Thomson Reuters shares are listed on the Toronto Stock Exchange (TSX: TRI) and New York Stock Exchange (NYSE: TRI). For more information, go to thomsonreuters.com.

Fine-tuning the studies has not diminished our ability to identify consistently high performance: 42 percent of this year's winners were 100 Top Hospitals winners last year. And many hospitals have won the award multiple times: 91 hospitals have won five or more times, and 10 have won 10 or more National awards.

MEASURING PERFORMANCE ACROSS THE INDUSTRY

Since 1993, the 100 Top Hospitals program has been dedicated to the use of statistically valid, actionable national benchmarks and the transparency of these measures for hospital performance improvement. The 100 Top Hospitals program currently includes the:

- 100 Top Hospitals: National Benchmarks and Everest Award for National Benchmarks, described here.

THE EVEREST AWARD FOR NATIONAL BENCHMARKS



Last year, Thomson Reuters introduced a major innovation in driving organizational performance improvement — the 100 Top Hospitals®: Everest Award for National Benchmarks. This award introduced a new methodology that integrates national benchmarks for highest achievement with national benchmarks for fastest long-term improvement.

The Everest award recognizes the boards, executives, and medical staff leaders who have developed and executed strategies that drove the highest rate of improvement, resulting in the highest performance in the country at the end of five years. Hospitals that win this award are setting national benchmarks for both long-term improvement and top one-year performance.

The Everest award winners are a special group of the 2009 100 Top Hospitals: National Benchmarks award winners that, in addition to achieving benchmark status for one year, have simultaneously set national benchmarks for the fastest long-term improvement on our national balanced scorecard.

VALUE TO THE HEALTHCARE INDUSTRY

Leaders making critical decisions in an economic downturn and an increasingly transparent environment must have more sophisticated intelligence that provides clearer insight into the complexity of changing organizational performance. They must also balance short- and long-term goals to drive continuous gains in performance and value. By comparing individual hospital and health system performance with integrated national benchmarks for highest achievement and improvement, we provide unique new insights for making smarter decisions that will achieve their mission and consistently increase value to the community.

VALUE TO HOSPITALS AND HEALTH SYSTEMS

Transparency presents hospital boards and CEOs with a very public challenge to increase the value of core services to their communities. Providing real value is not a one-time event — it is a continuous process of increasing worth over time. Leaders of hospitals and health systems must develop strategies to *continuously* strengthen both the organization and the value of their services to the community.

Integrating national benchmarks for highest achievement with national benchmarks for fastest long-term improvement radically increases the value of objective business information available for strategy development and decision making. Comparing hospital or health system performance to these integrated benchmarks allows leaders to review the effectiveness of long-term strategies that led to current performance. This integrated information enables boards and CEOs to better answer multi-dimensional questions, such as:

- Did our long-term strategies result in a stronger hospital across all performance areas?
- Did our strategies drive improvement in some areas but inadvertently cause deteriorating performance in others?
- What strategies will help us increase the rate of improvement in the right areas to come closer to national performance levels?
- What incentives do we set for management to achieve the desired improvement more quickly?
- Will the investments we're considering help us achieve improvement goals for the hospital or health system?
- Can we quantify the long- and short-term increases in value our hospital has provided to our community?

In this special Everest Award section, you will find the list of 100 Top Hospitals®: Everest Award for National Benchmarks winners and a description of the methodology we used to select the winners. Other sections of this study abstract include a list of the annual 100 Top Hospitals: National Benchmarks award winners, the methodology we used to select those winners, and a Findings section that details the benchmarks the winning hospitals have set for performance in the industry.

THE 2009 EVEREST AWARD FOR NATIONAL BENCHMARKS WINNERS

Thomson Reuters is proud to present the winners of the second annual Thomson Reuters 100 Top Hospitals: Everest Award for National Benchmarks.

2009 Everest Award for National Benchmarks Winners*

MEDICARE ID	HOSPITAL NAME	LOCATION
110029	Northeast Georgia Medical Center	Gainesville, GA
140182	Advocate Illinois Masonic Medical Center	Chicago, IL
140186	Riverside Medical Center	Kankakee, IL
140213	Silver Cross Hospital	Joliet, IL
140281	Northwestern Memorial Hospital	Chicago, IL
150084	St. Vincent Indianapolis Hospital	Indianapolis, IN
150097	Major Hospital	Shelbyville, IN
160117	The Finley Hospital	Dubuque, IA
230019	Providence Hospital and Medical Center	Southfield, MI
230092	Allegiance Health	Jackson, MI
230097	Munson Medical Center	Traverse City, MI
240036	St. Cloud Hospital	St. Cloud, MN
240076	Buffalo Hospital	Buffalo, MN
260022	Northeast Regional Medical Center	Kirksville, MO
390079	Robert Packer Hospital	Sayre, PA
440006	Skyline Medical Center	Nashville, TN
440039	Vanderbilt University Medical Center	Nashville, TN
440056	St. Mary's Jefferson Memorial Hospital	Jefferson City, TN
440082	Saint Thomas Hospital	Nashville, TN
440133	Baptist Hospital	Nashville, TN
450102	Trinity Mother Frances Hospital	Tyler, TX
460021	Dixie Regional Medical Center	St. George, UT
490069	Memorial Regional Medical Center	Mechanicsville, VA

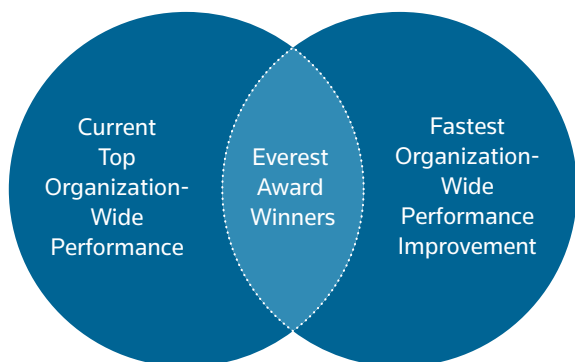
* Order of hospitals does not reflect performance rankings. Hospitals are ordered by Medicare ID.

HOW WE SELECT THE EVEREST AWARD WINNERS

Winners of the 100 Top Hospitals®: Everest Award for National Benchmarks are setting national benchmarks for both long-term (five-year) improvement and highest one-year performance on the study's balanced scorecard. Everest award winners are selected from among the new 100 Top Hospitals: National Benchmarks award winners. The National Benchmarks award and the Everest award are based on a set of measures that reflect highly effective performance across the whole organization.

Our methodology for selecting the Everest award winners can be summarized in three main steps:

1. Selecting the annual 100 Top Hospitals: National Benchmarks award winners using our time-tested objective methodology* based on publicly available data and a balanced scorecard of performance measures.
2. Using our multi-year trending methodology to select the 100 hospitals that have shown the fastest, most consistent five-year improvement rates on the same balanced scorecard of performance measures.†
3. Aligning these two lists of hospitals and looking for overlap; those that ranked in the top 100 of *both* lists are the Everest award winners.



Combining these two methodologies yields a very select group of Everest award winners; the number of Everest award winners will vary every year, based solely on performance. This year, only 23 hospitals achieved this status.

Data Sources

As with all of the 100 Top Hospitals awards, our methodology is objective and all data come from trusted public sources. We build a database of short-term, acute-care, nonfederal U.S. hospitals that treat a broad spectrum of patients. The primary data sources are the Medicare Provider Analysis and Review (MedPAR) dataset and the Medicare Cost Report. We use the five most recent years of data available – for this year's studies, federal fiscal years 2004-2008.

Several other datasets are also used. Core Measures and patient satisfaction (Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey) data are from the Centers for Medicare and Medicaid Services (CMS) Hospital Compare dataset. Residency program information, used in classifying teaching hospitals, is from the American Medical Association (Accreditation Council for Graduate Medical Education (ACGME)-accredited programs) and the American Osteopathic Association (AOA).

After excluding hospitals with data that would skew study results (e.g., specialty hospitals), we have a database study group of nearly 3,000 hospitals. Because bed size and teaching status have a profound effect on the types of patients a hospital treats and the scope of services it provides, we assigned each hospital in our study database to one of five comparison groups, or classes, according to its size and teaching status (for definitions of each group, see the Methodology section):

- Major Teaching Hospitals
- Teaching Hospitals
- Large Community Hospitals
- Medium Community Hospitals
- Small Community Hospitals

To judge hospitals fairly and compare them to like hospitals, we use these classes for all scoring and ranking of hospitals to determine winners. For more information on how we build the database, please see the Methodology section of this document.

* For full details on how the National Benchmarks winners are selected, please see the Methodology section of this document.

† This methodology is based on our previous 100 Top Hospitals: Performance Improvement Leaders study and award.

Performance Measures

Both the 100 Top Hospitals®: National Benchmarks award and the Everest award are based on a set of measures that reflect highly effective performance across the whole organization, including board members, medical staff, management, and nursing. These measures include patient outcomes and safety, national treatment standards (Core Measures), patient satisfaction, operational efficiency, and financial stability. The 10 measures used to select the 2009 winners are:

1. Risk-adjusted mortality index (in-hospital)
2. Risk-adjusted complications index
3. Risk-adjusted patient safety index
4. Core Measures mean percent
5. 30-day risk-adjusted mortality rate for acute myocardial infarction (AMI), heart failure, and pneumonia[§]
6. 30-day risk-adjusted readmission rate for AMI, heart failure, and pneumonia[§]
7. Severity-adjusted average length of stay
8. Expense per adjusted discharge, case mix- and wage-adjusted
9. Profitability (adjusted operating profit margin)
10. HCAHPS score (patient rating of overall hospital performance)[§]

For full details, including calculation and scoring methods, please see the Methodology section.

Final Selection: Ranking and Five-Year Trending

To select the 100 Top Hospitals: National Benchmarks award winners, we rank hospitals on the basis of their current-year performance on each of the 10 measures relative to other hospitals in their comparison group. We then sum each hospital's performance-measure rankings and re-rank them, overall, to arrive at a final rank for the hospital. (The new 30-day rates by patient condition each receive a weight of one-sixth. All other measures receive a weight of one.) The hospitals with the best final ranks in each comparison group are selected as the 100 Top Hospitals: National Benchmarks award winners.

Separately, for every hospital in the study, we calculate a t-statistic that measures five-year performance improvement on each of the seven performance measures.[§] This statistic measures both the direction and magnitude of change in performance, and the statistical significance of that change. Within the five comparison groups, we rank hospitals on the basis of their performance improvement t-statistic on each of the seven measures relative to other hospitals in their group. We then sum each hospital's performance-measure rankings and re-rank them, overall, to arrive at a final rank for the hospital. The hospitals with the best final rank in each comparison group are selected as the performance improvement benchmark hospitals.

As our final step, we align the two groups of benchmark hospitals and look for overlap. Those that are identified as benchmarks on *both* lists are the Everest award winners. The Everest award winners are a very select group – this year, only 23 hospitals were selected to win the award.

[§] Because these measures are new to the study this year and we do not have five years of data for them, they are not included in the five-year trending step of the Everest award winners selection process.

2009 THOMSON REUTERS 100 TOP HOSPITALS: NATIONAL BENCHMARKS AWARD WINNERS

Thomson Reuters is proud to present the 2009 100 Top Hospitals®: National Benchmarks award winners, listed on the following pages. We stratify winners by five separate peer comparison groups: major teaching, teaching, large community,

medium community, and small community hospitals. For full details on these peer groups and the process we use to select the benchmark hospitals, please see the Methodology section of this document.

Major Teaching Hospitals*		
MEDICARE ID	NAME	LOCATION
030064	University Medical Center	Tucson, AZ
050025	UC San Diego Medical Center - Hillcrest	San Diego, CA
140010	NorthShore University HealthSystem	Evanston, IL
140119	Rush University Medical Center	Chicago, IL
140182	<i>Advocate Illinois Masonic Medical Center</i>	Chicago, IL
140223	Advocate Lutheran General Hospital	Park Ridge, IL
140281	<i>Northwestern Memorial Hospital</i>	Chicago, IL
190036	Ochsner Medical Center	New Orleans, LA
230019	<i>Providence Hospital and Medical Center</i>	Southfield, MI
240061	Mayo Clinic - Rochester Methodist Hospital	Rochester, MN
360137	University Hospitals Case Medical Center	Cleveland, OH
360152	Doctors Hospital	Columbus, OH
390006	Geisinger Medical Center	Danville, PA
440039	<i>Vanderbilt University Medical Center</i>	Nashville, TN
450054	Scott and White Memorial Hospital	Temple, TX

* Order of hospitals does not reflect performance ranking. Hospitals are ordered by Medicare ID. Everest award winners are italicized.

Teaching Hospitals*		
MEDICARE ID	NAME	LOCATION
050424	Scripps Green Hospital	La Jolla, CA
060032	Rose Medical Center	Denver, CO
100289	Cleveland Clinic Florida	Weston, FL
130006	St. Luke's Boise Medical Center	Boise, ID
140186	<i>Riverside Medical Center</i>	Kankakee, IL
150084	<i>St. Vincent Indianapolis Hospital</i>	Indianapolis, IN
160045	St. Luke's Hospital	Cedar Rapids, IA
180035	St. Elizabeth Medical Center	Edgewood, KY
180093	Trover Health System	Madisonville, KY
230017	Bronson Methodist Hospital	Kalamazoo, MI
230038	Spectrum Health Hospital Group	Grand Rapids, MI
230097	<i>Munson Medical Center</i>	Traverse City, MI
230156	St. Joseph Mercy Hospital	Ann Arbor, MI
240036	<i>St. Cloud Hospital</i>	St. Cloud, MN
280060	Alegent Health Bergan Mercy Medical Center	Omaha, NE
360006	Riverside Methodist Hospital	Columbus, OH
360084	Aultman Hospital	Canton, OH
390063	Hamot Medical Center	Erie, PA
390079	<i>Robert Packer Hospital</i>	Sayre, PA
430016	Avera McKennan Hospital & University Health Center	Sioux Falls, SD
430027	Sanford USD Medical Center	Sioux Falls, SD
440133	<i>Baptist Hospital</i>	Nashville, TN
460004	McKay-Dee Hospital Center	Ogden, UT
520087	Gundersen Lutheran Health System	La Crosse, WI
520089	Meriter Hospital	Madison, WI

* Order of hospitals does not reflect performance ranking. Hospitals are ordered by Medicare ID. Everest award winners are italicized.

Large Community Hospitals*

MEDICARE ID	NAME	LOCATION
030087	Scottsdale Healthcare Shea	Scottsdale, AZ
050603	Saddleback Memorial Medical Center	Laguna Hills, CA
100044	Martin Memorial Medical Center	Stuart, FL
100070	Venice Regional Medical Center	Venice, FL
100281	Memorial Hospital West	Pembroke Pines, FL
110029	<i>Northeast Georgia Medical Center</i>	Gainesville, GA
140213	<i>Silver Cross Hospital</i>	Joliet, IL
140242	Central DuPage Hospital	Winfield, IL
150125	Community Hospital	Munster, IN
230092	<i>Allegiance Health</i>	Jackson, MI
260068	Boone Hospital Center	Columbia, MO
260108	Missouri Baptist Medical Center	St. Louis, MO
340032	Gaston Memorial Hospital	Gastonia, NC
440073	Maury Regional Medical Center	Columbia, TN
440082	<i>Saint Thomas Hospital</i>	Nashville, TN
440091	Memorial Health Care System	Chattanooga, TN
450102	<i>Trinity Mother Frances Hospital</i>	Tyler, TX
450431	St. David's Medical Center	Austin, TX
450610	Memorial Hermann Memorial City Medical Center	Houston, TX
450869	Doctors Hospital at Renaissance	Edinburg, TX

* Order of hospitals does not reflect performance ranking. Hospitals are ordered by Medicare ID. Everest award winners are italicized.

Medium Community Hospitals*

MEDICARE ID	NAME	LOCATION
010149	Baptist Medical Center East	Montgomery, AL
050758	Montclair Hospital Medical Center	Montclair, CA
100285	Memorial Hospital Miramar	Miramar, FL
110215	Piedmont Fayette Hospital	Fayetteville, GA
150157	St. Vincent Carmel Hospital	Carmel, IN
150162	St. Francis Hospital-Indianapolis	Indianapolis, IN
180116	Jackson Purchase Medical Center	Mayfield, KY
190144	Minden Medical Center	Minden, LA
230072	Holland Hospital	Holland, MI
360036	Wooster Community Hospital	Wooster, OH
360155	Southwest General Health Center	Middleburg Heights, OH
360236	Mercy Hospital Clermont	Batavia, OH
360276	St. Elizabeth Boardman Health Center	Youngstown, OH
390086	DuBois Regional Medical Center	DuBois, PA
440006	<i>Skyline Medical Center</i>	Nashville, TN
450847	Memorial Hermann Katy Hospital	Katy, TX
460021	<i>Dixie Regional Medical Center</i>	St. George, UT
490069	<i>Memorial Regional Medical Center</i>	Mechanicsville, VA
520035	Aurora Sheboygan Memorial Medical Center	Sheboygan, WI
520193	Aurora BayCare Medical Center	Green Bay, WI

Small Community Hospitals*

MEDICARE ID	NAME	LOCATION
010148	Evergreen Medical Center	Evergreen, AL
030033	Payson Regional Medical Center	Payson, AZ
050042	St. Elizabeth Community Hospital	Red Bluff, CA
050709	Desert Valley Hospital	Victorville, CA
150091	Parkview Huntington Hospital	Huntington, IN
150097	<i>Major Hospital</i>	Shelbyville, IN
160117	<i>The Finley Hospital</i>	Dubuque, IA
230069	St. Joseph Mercy Livingston Hospital	Howell, MI
230100	St. Joseph Hospital	Tawas City, MI
230212	St. Joseph Mercy Saline Hospital	Saline, MI
230259	Chelsea Community Hospital	Chelsea, MI
240076	<i>Buffalo Hospital</i>	Buffalo, MN
240213	Woodwinds Health Campus	Woodbury, MN
260022	<i>Northeast Regional Medical Center</i>	Kirksville, MO
260191	Barnes-Jewish St. Peters Hospital	St. Peters, MO
440056	<i>St. Mary's Jefferson Memorial Hospital</i>	Jefferson City, TN
440227	StoneCrest Medical Center	Smyrna, TN
450108	Connally Memorial Medical Center	Floresville, TX
450270	Lake Whitney Medical Center	Whitney, TX
460023	American Fork Hospital	American Fork, UT

* Order of hospitals does not reflect performance ranking. Hospitals are ordered by Medicare ID. Everest award winners are italicized.

NATIONAL BENCHMARKS STUDY METHODOLOGY

OVERVIEW

The 100 Top Hospitals®: National Benchmarks is a quantitative study that identifies 100 hospitals with the highest achievement on the 100 Top Hospitals: National Benchmarks Balanced Scorecard. The scorecard, based on Norton and Kaplan's¹ balanced scorecard concept, consists of 10 measures, distributed across four domains – quality, efficiency, finance, and consumer assessment of care – and uses only publicly available data. The hospitals with the highest achievement are those with the highest ranking on a composite score of the 10 measures. This study includes only short-term, acute-care, nonfederal U.S. hospitals that treat a broad spectrum of patients.

The main steps we take in selecting the 100 Top Hospitals are:

- Building the database of hospitals, including special selection and exclusion criteria
- Classifying hospitals into comparison groups by size and teaching status
- Scoring hospitals on balanced scorecard of 10 performance measures
- Determining 100 Top Hospitals by ranking hospitals relative to their comparison group

The following document is intended to be an overview of these steps. To request more detailed information on any of the study concepts outlined here, please e-mail us at healthcare.pubs@thomsonreuters.com or call +1 800 366 7526.

Note: This section details the methods used to produce the 100 Top Hospitals: National Benchmarks award winners. For details on the methods used to find the Everest Award for National Benchmarks winners, please see the special Everest Awards section of this document.

BUILDING THE DATABASE OF HOSPITALS

Like all 100 Top Hospitals studies, the National Benchmarks study uses only publicly available data. The data primarily come from:

- The Medicare Provider Analysis and Review (MedPAR) dataset
- The Centers for Medicare and Medicaid Services (CMS) Hospital Compare dataset
- The Medicare Cost Report

We use MedPAR patient-level medical record information to calculate our mortality, complications, patient safety, and length of stay performance measures. The MedPAR dataset contains information on the approximately 12 million Medicare patients discharged annually from U.S. acute-care hospitals. In this year's study, we used the most recent two federal fiscal years of MedPAR data available, 2007 and 2008.¹⁹ To be included in the study, a hospital must have had both years of data available. In 2008, CMS began requiring hospitals to report Medicare managed care (HMO) patient encounter data. Compliance was not uniform across all hospitals in the MedPAR 2008 dataset.

Note: To choose the Everest award winners, we also reviewed the most recent five years of data, 2004 through 2008, to study the rate of change in performance through the years. To read more about the Everest award methodology, please see the special Everest Award section of this document.

We use Medicare Cost Reports to create our proprietary database, which contains hospital-specific demographic information and hospital-specific all-payer revenue and expense data used to calculate the financial measures. The Medicare Cost Report is filed annually by every U.S. hospital that participates in the Medicare program. Hospitals are required to submit cost reports in order to receive reimbursement from Medicare.

Cost report data include services for all patients, not just Medicare beneficiaries; however, Medicare managed care (HMO) beneficiary information is not currently available.

The Medicare Cost Report promotes comparability and consistency among hospitals in reporting, and its accuracy is certified under penalty of law. We used hospital 2008 cost reports, published in the Federal Hospital Cost Report Information System (HCRIS) third quarter 2009 dataset, for this study. If we did not have a 2008 cost report, we excluded the hospital from the study. Hospitals that file cost reports jointly with other hospitals under one provider number are analyzed as one organization.

We and many others in the healthcare industry have used the MedPAR and Medicare Cost Report databases for many years. We believe them to be accurate and reliable sources for the types of analyses performed in this study. Performance based on Medicare data has been found to be highly representative of that of all-payer data. Medicare patients usually represent 30 to 40 percent of a hospital's revenue, and many previous academic and economic studies of healthcare in the United States.

We use the CMS Hospital Compare Data for the following measures:

- Core Measures, 30-day mortality rates, 30-day readmission rates and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) patient perception of care are from the CMS Hospital Compare dataset published the third quarter of 2009.
- Residency program information, used in classifying teaching hospitals, is from the American Medical Association (Accreditation Council for Graduate Medical Education (ACGME)-accredited programs) and the American Osteopathic Association (AOA).

Data periods included in each dataset vary and are discussed at the end of this section.

After building the database, we excluded a number of hospitals that would have skewed the study results. Excluded from the study were:

- Hospitals for which a current Medicare Cost Report was not available
- Hospitals with a current Medicare Cost Report that was not for a 12-month reporting period
- Specialty hospitals (e.g., critical access,

children's, women's, psychiatric, substance abuse, rehabilitation, cardiac, orthopedic, heart, cancer, and long-term acute-care hospitals)

- Federally owned hospitals
- Non-U.S. hospitals (such as those in Puerto Rico, Guam, and the U.S. Virgin Islands)
- Hospitals with fewer than 25 acute-care beds
- Hospitals with fewer than 100 Medicare patient discharges in federal fiscal year (FFY) 2008
- Hospitals with Medicare average lengths of stay longer than 30 days in FFY 2008
- Hospitals with overall Medicare mortality rates (number of deaths divided by total discharges) of less than one percent in FFY 2007 and 2008 combined
- Hospitals missing data required to calculate performance measures

In addition, specific patient records were also excluded:

- Patients who were discharged to another short-term facility (this is done to avoid double counting)
- Patients who were not at least 65 years old
- Rehabilitation, psychiatric, and substance-abuse patients
- Patients receiving palliative care (ICD-9-CM code V66.7)
- Patients with stays shorter than one day

After all exclusions were applied, 2,926 hospitals were included in the study.

CLASSIFYING HOSPITALS INTO COMPARISON GROUPS

Bed size, teaching status, and residency-program involvement have a profound effect on the types of patients a hospital treats and the scope of services it provides. When analyzing the performance of an individual hospital, it is crucial to evaluate it against other similar hospitals. To address this, we assigned each hospital to one of five comparison groups, or classes, according to its size and teaching status.

Our classification methodology draws a significant distinction between major teaching hospitals and teaching hospitals by measuring the magnitude and type of teaching programs, and by accounting for their level of involvement in physician education and research. This methodology de-emphasizes the role of bed size and focuses more on teaching-program involvement. Through it, we seek to measure both the depth and breadth of teaching

involvement and recognize teaching hospitals' tendencies to reduce beds and concentrate on true tertiary care.

Our formula for defining the teaching comparison groups includes each hospital's bed size, residents-to-beds ratio, and involvement in graduate medical education programs accredited by either the ACGME²⁰ or the AOA.²¹ The definition includes both the magnitude (number of programs) and type (sponsorship or participation) of GME program involvement. In this study, AOA residency program involvement was treated as being equivalent to ACGME program sponsorship.

The five comparison groups, and their parameters, are as follows (the number of hospitals included in each study group is in parentheses):

Major Teaching Hospitals (173 in study)

There are three ways to qualify:

1. 400 or more acute-care beds in service plus an intern and resident-per-bed ratio of at least 0.25, plus
 - sponsorship of at least 10 GME programs or
 - involvement in at least 20 programs overall
2. Involvement in at least 30 GME programs overall (regardless of bed size or intern and resident-per-bed ratio)
3. An intern and resident-per-bed ratio of at least 0.60 (regardless of bed size or GME program involvement)

Teaching Hospitals (423 in study)

- 200 or more acute-care beds in service and
- either an intern and resident-per-bed ratio of at least 0.03 or involvement in at least three GME programs overall

Large Community Hospitals (338 in study)

- 250 or more acute-care beds in service and
- not classified as a teaching hospital per definitions above

Medium Community Hospitals (1,028 in study)

- 100 – 249 acute-care beds in service and
- not classified as a teaching hospital per definitions above

Small Community Hospitals (964 in study)

- 25 – 99 acute-care beds in service and
- not classified as a teaching hospital per definitions above

SCORING HOSPITALS ON WEIGHTED PERFORMANCE MEASURES

Evolution of Performance Measures

We use a balanced scorecard approach, based on public data, to select the measures most useful for boards and CEOs in the current operating environment. Throughout the life of the study, we have worked hard to meet this vision. We gather feedback from industry leaders, hospital executives, academic leaders, and internal experts; review trends in the healthcare market; and survey hospitals in demanding marketplaces to learn what measures are valid and reflective of top performance. As the market has changed, our methods have evolved.

This evolution has led us to make a number of changes to this year's study. As always, our measures are centered on four main components of hospital performance: quality, efficiency, finance, and consumer assessment of care.

The measures for the 2009 study are:

1. Risk-adjusted mortality index (in-hospital)
2. Risk-adjusted complications index
3. Risk-adjusted patient safety index
4. Core Measures mean percent
5. 30-day risk-adjusted mortality rate for acute myocardial infarction (AMI), heart failure, and pneumonia*
6. 30-day risk-adjusted readmission rate for AMI, heart failure, and pneumonia*
7. Severity-adjusted average length of stay
8. Expense per adjusted discharge, case mix- and wage-adjusted
9. Profitability (adjusted operating profit margin)
10. HCAHPS score (patient rating of overall hospital performance)

* New measure in the 2009 study.

Below we provide a rationale for the selection of our balanced scorecard categories and the measures used for each.

Clinical Excellence

Our measures of clinical excellence are the risk-adjusted mortality index, risk-adjusted complications index, 30-day mortality rate, 30-day readmission rate, risk-adjusted patient safety index, and the Core Measures mean percent.

The mortality and complications measures show us how the hospital is performing on the most basic and essential care standards — survival and error-free care — while treating patients in the hospital. The new extended outcomes measures — 30-day mortality and readmission rates for AMI, heart failure, and pneumonia patients — help us understand how the hospital's patients are faring over a longer period.

These measures are part of CMS' value-based purchasing program and are watched closely in the industry. Hospitals with lower values appear to be providing care with better medium-term results for these conditions.

Patient safety has become an increasingly important measure of hospital quality. The risk-adjusted patient safety index is based on the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators (PSIs).²² Patient safety measures are reflective of both clinical quality and the effectiveness of systems within the hospital. Because they use hospital administrative data and focus on surgical complications and other iatrogenic events, we feel that AHRQ's PSIs provide an unbiased look at many aspects of patient safety inside hospitals. Such objective analysis is central to the 100 Top Hospitals[®] mission. The risk-adjusted patient safety index facilitates comparison of national and individual hospital performance using a group of eight PSIs, which allows us to gauge the results of hospital-wide patient safety performance.

To be truly balanced, a scorecard must include various measures of quality. To this end, we also include an aggregate Core Measures score. Core Measures were developed by the Joint Commission and endorsed by the National Quality Forum as minimum basic process of care standards. They are a widely accepted method for measuring patient care quality that includes specific guidelines for heart attack, heart failure, pneumonia, pregnancy and related conditions, and surgical-infection prevention. Our Core Measures score is based on the heart attack, heart failure, pneumonia, and surgical-infection prevention areas of this program, using Hospital Compare data reported on the CMS Web site.²³

Efficiency and Financial Health

This category includes severity-adjusted average length of stay, expense per adjusted discharge, and adjusted operating profit margin. For the life of the study, severity-adjusted average length of stay has

served as a proxy for clinical efficiency and expense per adjusted discharge has served as a measure of operating efficiency. The operating profit margin is a measure of management's ability to operate within its current financial constraints.

All three measures require adjustment to increase the validity of comparisons across the hospital industry. We adjust total operating expenses, as reported on the Cost Report, for related organization expense and for provider-based physician salaries related to direct patient care. These adjustments allow us to more accurately reflect a hospital's real operating expenses. We adjust operating profit to reflect related organization expense to provide a more accurate measure of a hospital's profitability.

Previous studies used the cash-to-total-debt ratio to look at a hospital's liquidity. Such measures of liquidity are one way to measure the financial viability and health of an organization. However, measuring liquidity has become problematic as more and more hospitals join health systems. Health system accounting practices often recognize hospitals as units of the system, with no cash or investment assets of their own; a typical practice is to sweep cash up to the system accounts daily. Moreover, hospitals in health systems are now often reported as having no debt in their own name. Using public data, there is no effective way to accurately determine liquidity, so we have removed the cash-to-debt measure from the National Benchmarks study.

Patient Perception of Care

We believe that a true measure of patient perception of care is crucial to the balanced scorecard concept. Understanding how patients perceive the care it provides, and how that perception compares and contrasts with that of its peers, is an important step a hospital must take in pursuing performance improvement. In this year's study, we've added a new performance measure — the HCAHPS score — based on patient perception of care data from the HCAHPS patient survey. In the 2009 study, the HCAHPS score is based on the HCAHPS overall hospital rating question only.

Through the combined measures described above, we hope to provide a balanced picture of overall quality of care and financial health and reflect the probability of sustained high performance. Full details about each of these performance measures are included on the following pages.

PERFORMANCE MEASURES USED IN THE 2009 100 TOP HOSPITALS: NATIONAL BENCHMARKS STUDY

Risk-Adjusted Mortality Index (In-Hospital)			
WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>Patient survival is a universally accepted measure of hospital quality. The lower the mortality index, the greater the survival of the patients in the hospital, considering what would be expected based on patient characteristics. While all hospitals have patient deaths, this measure can show where deaths did not occur but were expected, or the reverse, given the patient's condition.</p>	<p>We calculate an index value based on the number of actual in-hospital deaths in 2007 and 2008, combined, divided by the number expected, given the risk of death for each patient. We normalize the index based on the observed and expected deaths for each comparison group. This measure is based on our proprietary risk-adjusted mortality index model, which is designed to predict the likelihood of a patient's death based on patient-level characteristics (age, sex, presence of complicating diagnoses, and other characteristics) and factors associated with the hospital (size, teaching status, geographic location, and community setting).</p> <p>Post-discharge deaths are not considered. For more details on the model, see Appendix C. The reference value for this index is 1.00; a value of 1.15 indicates 15 percent more deaths occurred than were predicted, and a value of 0.85 indicates 15 percent fewer deaths than predicted.</p>	<p>We based the scoring on the difference between observed and expected deaths, expressed in normalized standard deviation units (z-score).^{24,25} Hospitals with the fewest deaths, relative to the number expected, after accounting for standard binomial variability, received the most favorable scores. We used two years of MedPAR data (2007 and 2008) to reduce the influence of chance fluctuation. Normalization was done by comparison group. Hospitals with values that were high statistical outliers, based on a normalized z-score greater than or equal to 1.64 (95 percent confidence), were not eligible to be named as benchmarks.</p>	<p>Below the median</p>

Risk-Adjusted Complications Index

WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>Keeping patients free from potentially avoidable complications is an important goal for all healthcare providers. A lower complications index indicates fewer patients with complications, considering what would be expected based on patient characteristics. Like the mortality index, this measure can show where complications did not occur but were expected, or the reverse, given the patient's condition.</p>	<p>We calculate an index value based on the number of cases with complications in 2007 and 2008, combined, divided by the number expected, given the risk of complications for each patient. We normalize the index based on the observed and expected complications for each comparison group. This measure uses our proprietary expected complications rate index models. These models account for patient-level characteristics (age, sex, principal diagnosis, comorbid conditions, and other characteristics), as well as differences in hospital characteristics (size, teaching status, geographic location, and community setting). Complications rates are calculated from normative data for two patient risk groups: medical and surgical. For more details on the model, see Appendix C.</p> <p>The reference value for this index is 1.00; a value of 1.15 indicates 15 percent more complications occurred than were predicted, and a value of 0.85 indicates 15 percent fewer complications than predicted.</p>	<p>We based the scoring on the difference between the observed and expected number of patients with complications, expressed in normalized standard deviation units (z-score).^{7,8} Normalization was done by comparison group. Hospitals with the fewest observed complications, relative to the number expected, after accounting for standard binomial variability, received the most favorable scores. We used two years of MedPAR data (2007 and 2008) to reduce the influence of chance fluctuation. Hospitals with values that were high statistical outliers, based on a normalized z-score greater than or equal to 1.64 (95 percent confidence), were not eligible to be benchmark hospitals.</p>	<p>Below the median</p>

Risk-Adjusted Patient Safety Index

WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>Patient safety has become an increasingly important measure of hospital quality. Patient safety measures are reflective of both clinical quality and the effectiveness of systems within the hospital. The AHRQ, a public health service agency within the federal government's Department of Health and Human Services, has developed a set of PSIs. These indicators are widely used as a means of measuring hospital safety. Because they use hospital administrative data and include surgical complications and other iatrogenic events, we feel that AHRQ's PSIs provide an unbiased look at the quality of care inside hospitals. Such objective analysis is central to the 100 Top Hospitals® mission.</p>	<p>For each of the eight included PSIs (see Appendix C for a list), we calculated an index value based on the number of actual PSI occurrences for 2007 and 2008, combined, divided by the number of normalized expected occurrences, given the risk of the PSI event for each patient. Values were normalized by comparison group. We applied hospital-level PSI methodology from AHRQ to the 2007 and 2008 MedPAR acute-care data, using AHRQ program code to adjust for risk.²²</p> <p>The reference value for this index is 1.00; a value of 1.15 indicates 15 percent more events than predicted, and a value of 0.85 indicates 15 percent fewer.</p>	<p>We based the scoring on the difference between the observed and expected number of patients with PSI events, for each of the eight selected PSIs, expressed in standard deviation units (z-score).^{7,8} We normalized z-scores by hospital comparison group, and developed a mean normalized z-score as an aggregate PSI score. Hospitals with the fewest observed PSIs, relative to the number expected, accounting for binomial variability, received the most favorable scores. We used two years of MedPAR data (2007 and 2008) to reduce the influence of chance fluctuation. Hospitals with extreme outlier values in this measure were not eligible to be named benchmarks (see "Eliminating Outliers" below).</p>	<p>Below the median</p>

Core Measures Mean Percent

WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>To be truly balanced, a scorecard must include various measures of quality. Core Measures were developed by the National Quality Forum as minimum basic standards. They are a widely accepted method for measuring patient care quality that includes specific guidelines for heart attack, heart failure, pneumonia care, and surgical-infection prevention.</p>	<p>For each hospital, we calculate the arithmetic mean of the included Core Measure percent values. The reported Core Measure percent values reflect the percentage of eligible patients who received the expected standard of patient care. We consider reported Core Measure percents with patient counts less than or equal to 25 or with relative standard error values greater than or equal to 0.30 statistically unreliable. In these cases, we substitute the comparison group-specific median percent value for the affected Core Measure.</p>	<p>Core Measure values are from the CMS Hospital Compare Web site, for calendar year 2008. We included 24 of the 25 reported heart attack (acute myocardial infarction), heart failure, pneumonia, and surgical-infection prevention Core Measures. (We excluded one AMI Core Measure due to under-reporting). For small community hospitals we excluded two additional Core Measures, due to very low reporting. For a list of the measures used, please see Appendix C.</p>	<p>Higher</p>

30-Day Risk-Adjusted Mortality Rates for AMI, Heart Failure, and Pneumonia Patients

WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>30-day mortality rates are a widely accepted measure of the effectiveness of hospital care. They allow us to look beyond immediate inpatient outcomes and understand how the care the hospital provided to inpatients with these particular conditions may have contributed to their longer-term survival. Because these measures are part of CMS' value-based purchasing program, they are now being watched closely in the industry. In addition, tracking these measures may help hospitals identify patients at risk for post-discharge problems and target improvements in discharge planning and in aftercare processes. Hospitals that score well may be better prepared for a pay-for-performance structure.</p>	<p>CMS calculates a 30-day mortality rate for each patient condition using three years of MedPAR data, combined. CMS does not calculate rates for hospitals where the number of cases is too small (less than 25). We build a database of this information for the hospitals in our study then rank the hospitals independently on each of the three conditions (AMI, heart failure, and pneumonia), by hospital comparison group. Each patient condition receives one-sixth weight, for a total 30-Day Mortality Rate weight of one-half in overall hospital ranking.</p>	<p>Data are from the CMS Hospital Compare dataset for the third quarter of 2009. The longitudinal data period is July 1, 2005, through June 30, 2008. For more information about this data, see Appendix C.</p>	<p>Below the median</p>

30-Day Risk-Adjusted Readmission Rates for AMI, Heart Failure, and Pneumonia Patients

WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>30-day readmission rates are a widely accepted measure of the effectiveness of hospital care. They allow us to understand how the care the hospital provided to inpatients with these particular conditions may have contributed to issues with their post-discharge medical stability and recovery. Because these measures are part of CMS' value-based purchasing program, they are now being watched closely in the industry. In addition, tracking these measures may help hospitals identify patients at risk for post-discharge problems if discharged too soon, as well as target improvements in discharge planning and in aftercare processes. Hospitals that score well may be better prepared for a pay-for-performance structure.</p>	<p>CMS calculates a 30-day readmission rate for each patient condition using three years of MedPAR data, combined. CMS does not calculate rates for hospitals where the number of cases is too small (less than 25). We build a database of this information for the hospitals in our study then rank the hospitals independently on each of the three conditions (AMI, heart failure, and pneumonia), by hospital comparison group. Each patient condition receives one-sixth weight, for a total 30-Day Readmission Rate weight of one-half in overall hospital ranking.</p>	<p>Data are from the CMS Hospital Compare dataset for the third quarter of 2009. The longitudinal data period is July 1, 2005, through June 30, 2008. For more information about this data, see Appendix C.</p>	<p>Below the median</p>

Severity-Adjusted Average Length of Stay

WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>A lower severity-adjusted average length of stay (ALOS) generally indicates more efficient consumption of hospital resources and reduced risk to patients.</p>	<p>We calculate the average patient length of stay, adjusted for differences in severity of illness. Adjustments are made using the refined diagnosis-related group (RDRG) methodology, based on MedPAR records only. Patients are assigned a weight corresponding to the relative severity of their condition. These weights are then used to compute an expected length of stay for each patient, given the characteristics of that patient. A severity-adjusted ALOS is then computed for each hospital. Values are normalized based on the observed and expected LOS of the hospital's comparison group.</p>	<p>This measure uses MedPAR data for 2008. It allows the average inpatient length of stay at a hospital to be compared with that of other hospitals in a market. This measure eliminates differences due to the varying severity of illness of patients at each hospital, allowing for a more valid comparison. We score this measure by ranking the ALOS.</p>	<p>Below the median</p>

Expense per Adjusted Discharge, Case Mix- and Wage-Adjusted

WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>This measure helps to determine how efficiently a hospital cares for its patients. Low values indicate lower costs and thus better efficiency.</p>	<p>Total adjusted operating expenses divided by the number of adjusted discharges, case mix- and wage-adjusted. See Appendix C for detailed calculations and the Medicare Cost Report locations (worksheet, line, and column) for each calculation element.</p>	<p>This measure uses 2008 Medicare Cost Report data. Expense per adjusted discharge measures the hospital's average cost of delivering care on a per-unit basis. Operating expense includes adjustments for related organizational expenses and provider-based physician salaries related to direct patient care. Discharges are adjusted by multiplying the number of acute-care discharges by a factor that inflates it to include inpatient acute-care, inpatient nonacute-care, and outpatient discharges. Case-mix adjustments account for differences in complexity, according to the CMS-assigned Medicare case mix. Wage adjustments account for geographic differences in cost of living, according to the CMS wage index. Hospitals with extreme outlier values in this measure were not eligible to be named benchmarks (see "Eliminating Outliers" below).</p>	<p>Below the median</p>

Profitability (Operating Profit Margin)

WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
<p>Profitability is one of the purest measures of a hospital's financial health. It is a clear measure of the amount of income a hospital is taking in versus its expenses.</p>	<p>The difference between a hospital's total operating revenue and total operating expense, expressed as a percentage of its total operating revenue. Total operating revenue is the sum of net patient revenue plus other operating revenue. See Appendix C for detailed calculations and the Medicare Cost Report locations (worksheet, line, and column) for each calculation element.</p>	<p>This measure uses 2008 Medicare Cost Report data. Adjusted operating profit margin is a measure of a hospital's profitability with respect to its patient care services and operations, expressed as a percentage. Operating expense includes adjustment for related organizational expenses. Extreme outlier values in this measure were not eligible to be named benchmarks (see "Eliminating Outliers" below). We score hospitals by ranking the adjusted operating profit margin.</p>	<p>Above the median</p>

HCAHPS Score (Patient Rating of Overall Hospital Performance)			
WHY WE INCLUDE THIS ELEMENT	CALCULATION	COMMENT	FAVORABLE VALUES ARE
We believe that including a measure of patient perception of care is crucial to the balanced scorecard concept. How patients perceive the care a hospital provides has a direct effect on its ability to remain competitive in the marketplace.	<p>We used the HCAHPS survey instrument question number 100, "How do patients rate the hospital, overall?" to score hospitals. Patient responses could fall into three categories, and the number of patients in each category was reported as a percent:</p> <ul style="list-style-type: none"> • Patients who gave a rating of 6 or lower (low) • Patients who gave a rating of 7 or 8 (medium) • Patients who gave a rating of 9 or 10 (high) <p>For each answer category, we assigned a scale as follows: 3 equals high or good performance, 2 equals medium or average performance, and 1 equals low or poor performance. We then calculated a weighted score for each hospital by multiplying the HCAHPS answer percent by the scale value. For each hospital, we summed the weighted percent values for the three answer categories. Hospitals were then ranked by this weighted percent sum.</p>	Data are from CMS Hospital Compare, third quarter 2009, database. This database contains the HCAHPS results for data period January 1, 2008, through December 31, 2008.	Above the median

Summary of Balanced Scorecard Measure Data Sources, Data Periods, and Ranking Weights

SCORECARD MEASURE	DATA SOURCE/DATA PERIOD	RANKING WEIGHT
Risk-Adjusted Mortality Index	MedPAR 2007 & 2008 (federal fiscal year)	1
Risk-Adjusted Complications Index	MedPAR 2007 & 2008 (federal fiscal year)	1
Risk-Adjusted PSI	MedPAR 2007 & 2008 (federal fiscal year)	1
Core Measures Mean Percent	CMS Hospital Compare (calendar year 2008)	1
30-Day Mortality Rate	CMS Hospital Compare (July 1, 2005 – June 30, 2008)	½
30-Day Readmission Rate	CMS Hospital Compare (July 1, 2005 – June 30, 2008)	½
Severity-Adjusted ALOS	MedPAR 2008 (federal fiscal year)	1
Expense per Adjusted Discharge	HCRIS, 3rd quarter 2009 (2008 Medicare Cost Reports)	1
Adjusted Operating Profit Margin	HCRIS, 3rd quarter 2009 (2008 Medicare Cost Reports)	1
HCAHPS Score	CMS Hospital Compare (calendar year 2008)	1

DETERMINING THE 100 TOP HOSPITALS

Eliminating Outliers

Within each of the five hospital comparison groups, we scored hospitals based on their performance on each of the measures relative to other hospitals in their group. We used the interquartile range methodology (IQR) to identify hospitals with extreme outlier values for the following measures:

- Risk-adjusted patient safety index
- Expense per adjusted discharge, case mix- and wage-adjusted
- Adjusted operating profit margin

To reduce the impact of unsustainable performance anomalies and reporting anomalies or errors, hospitals identified as having extreme outlier values in any of these measures, and hospitals with one or more mortality or complications normalized z-scores that were high statistical outliers (95 percent confidence) were not eligible to be named benchmarks.

The IQR methodology is a straightforward, tested method for identifying outliers in a dataset like the ones used in 100 Top Hospitals® studies. In addition, hospitals with a negative operating profit margin were not eligible to be named benchmarks. This was done because we do not want hospitals that fail to meet this very basic financial responsibility to be declared winners.

Ranking

Within the five hospital comparison groups, we ranked hospitals on the basis of their performance on each of the 10 measures relative to other hospitals in their group. We then summed each hospital's performance-measure rankings and re-ranked, overall, to arrive at a final rank for the hospital. The hospitals with the best final rank in each comparison group were selected as the winners.

All measures except the 30-day mortality rate and 30-day readmission rate received a weight of one in the final ranking process. For the 30-day mortality and readmission rate measures, we give the rates for each of the conditions (AMI, heart failure, and pneumonia) a weight of one-sixth in the final 100 Top Hospitals ranking process for winner selection.

The national list of top-performing hospitals includes:

COMPARISON GROUP	NUMBER OF WINNERS
Major Teaching Hospitals	15
Teaching Hospitals	25
Large Community Hospitals	20
Medium Community Hospitals	20
Small Community Hospitals	20
All Hospitals	100

Thomson Reuters Policy on Revocation of a 100 Top Hospitals Award

To preserve the integrity of the study, it is the policy of Thomson Reuters to revoke a 100 Top Hospitals award if a hospital is found to have submitted inaccurate or misleading data to any 100 Top Hospitals data source.

At the sole discretion of Thomson Reuters, the circumstances under which a 100 Top Hospitals award could be revoked include, but are not limited to, the following:

1. Discovery by Thomson Reuters staff, through statistical analysis or other means, that a hospital has submitted inaccurate data.
2. Discovery of media or internet reports of governmental or accrediting agency investigations or sanctions for actions by a hospital that could have an adverse impact on the integrity of the 100 Top Hospitals studies or award winner selection.

FINDINGS

The 100 Top Hospitals® national award winners are true leaders in the industry. Year after year, the objective data we gather for the 100 Top Hospitals studies provide numerous examples of the benchmark hospitals' financial and operational excellence.²⁻¹⁸ These hospitals are providing tangible value to their communities and the patients they treat. For their competitors and peers, they offer a valuable example to follow. The findings presented in this document give hospital leaders benchmarks of top performance – by showing what the top performers have achieved, we offer concrete goals for the entire industry.

This year, we have estimated that if all Medicare inpatients received the same level of care as those in the 100 Top Hospitals winners across all categories:

- More than 98,000 additional patients would survive each year.
- More than 197,000 patient complications would be avoided annually.
- Expenses would decline by an aggregate \$5.5 billion a year.
- The average patient stay would decrease by half a day.

If the same standards were applied to all inpatients, the impact would be even greater.

In this section, we share a variety of data that highlights the good work the winning hospitals are doing, and compare their performance to that of their peers.

PROFIT MARGIN TRENDS VARY BY HOSPITAL TYPE

Hospitals have not been spared the pain of the economic downturn of the last several years. Profit margins have fallen, and a sizable number of hospitals are now operating with negative margins. But the negative impacts are not being felt evenly. Obviously, some hospitals are thriving, while others are failing. Studying these differences can yield important lessons for hospital executives. Bed size and teaching status have a great impact on how hospitals operate financially. Among our five

study hospital comparison groups, there is marked variability in profit margins and their increase or decline through the years.

Table 1: Trends in Negative Profitability

HOSPITAL COMPARISON GROUP	PERCENT OF IN-STUDY HOSPITALS WITH NEGATIVE OPERATING PROFIT MARGIN, BY STUDY YEAR (%)			
	2006	2007	2008	2009
All Hospitals	27.1	28.2	28.1	33.4
Major Teaching	31.3	24.4	27.7	35.8
Teaching	23.2	24.3	25.1	30.3
Large Community	18.3	21.0	22.8	24.6
Medium Community	28.1	28.9	27.7	31.9
Small Community	29.8	32.2	31.6	39.0

Table 1 shows the percentage of hospitals in the National Benchmarks study that had negative operating profit margins in each of the last four study years. (The number of in-study hospitals varies slightly each year, ranging from a low of 2,834 in the 2006 study to a high of 3,018 in the 2008 study.) Some observations we've made are:

- The percentage and number of hospitals with negative operating profit margins increased for all of the hospital types we studied.
- The variability, by hospital comparison group, in the percentage of hospitals with negative operating profit margins declined steadily through the 2004 through 2008 study years. In the 2009 study, this variability has increased again. The largest variability can be found in the small community hospital class, which is more vulnerable to shifts in patient volume and/or payer mix.
- The variability in this measure across years is much higher in major teaching hospitals than in the other hospital comparison groups, but some or all of this increased variability would be due to the smaller number of hospitals in this group compared with the other groups.

- Large community and teaching hospitals may be weathering the economic downturn better than other types: these two groups had a lower proportion of hospitals with negative operating profit margins across all study years. It could be that these hospitals started cutting costs sooner. Another possibility is that larger hospitals, with their higher patient load, can moderate their staffing more easily, even with the typical ups and downs of patient census. And they may have more economies of scale in management positions and in back office functions.

NATIONAL BENCHMARKS WINNERS SCORE BETTER ON EXTENDED OUTCOMES MEASURES

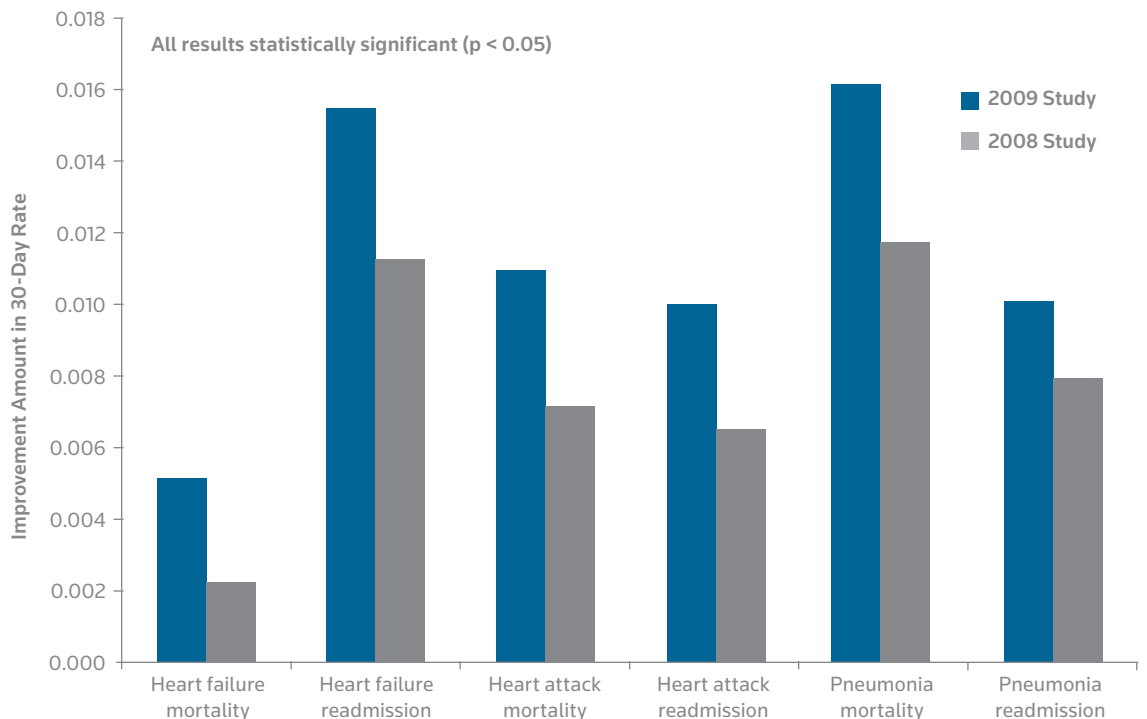
To help round out our balanced scorecard in the area of clinical excellence, we added a new domain – extended outcome measures – to the study this year. This domain includes 30-day mortality rate and 30-day readmission rate, as defined by the CMS Hospital Compare dataset. These rates cover three specific clinical groups of patients: heart attack (AMI), heart failure, and pneumonia. These measures are described as valid indicators of hospital-specific quality of care in that lower risk-adjusted rates represent higher quality. We studied the correlation between how the winning hospitals scored on these two measures and how they scored on the total composite of all 10 measures used in the 2009 100 Top Hospitals®: National Benchmarks study, and separately, all nine measures used in the 2008 study. Our

objective was to determine the extent to which the performance measurement approach underlying the 100 Top Hospitals study is consistent with performance on the CMS 30-day mortality and readmission measures, based on statistical correlation across hospitals. We found that there was a significant correlation, and that the winning hospitals are performing better than non-winners on these measures.

We assigned all hospitals (nearly 3,000) included in the 2009 study a percentile ranking indicating level of performance within their respective comparison group. We then evaluated these percentile rankings for consistency with the CMS Hospital Compare hospital-specific rates for 30-day mortality and 30-day readmission for the three clinical groups.

The measure of interest in these analyses was the estimate, or model coefficient, associated with the 100 Top Hospitals performance percentile metric. This is interpreted as the amount of improvement in the risk-adjusted rate of the respective 30-day outcome for each unit increase in the 100 Top Hospitals metric. In other words, for a given model, each unit increase (one percentile point) in the 100 Top Hospitals performance percentile would produce an improvement in the respective 30-day rate of X amount, where X is the estimate. We found that all of the regression coefficients (estimates) were directionally consistent with higher performance on the CMS measures

Figure 1: Performance on CMS 30-Day Measures Versus 100 Top Hospitals Study Metric



correlating with higher performance on the 100 Top Hospitals metric (Figure 1). All correlations were statistically significant.

In the 2009 study, the six 30-day outcome measures accounted for one-ninth of the weight of the 100 Top Hospitals® overall performance score. As such, it is virtually certain that some of the agreement between performance on the CMS 30-day mortality and readmission measures and the results for the 2009 study is due to influence of the CMS measures on the 100 Top Hospitals performance metric. However, the 2008 study did not use any of the CMS 30-day measures, yet identical results in terms of direction, and very similar results in terms of magnitude of the associations, were obtained using the 2008 data. It is clear from the 2008 data that the two sets of performance metrics were significantly associated even before the CMS measures were used in the 2009 study.

MIDWEST STATES LEAD IN HOSPITAL PERFORMANCE

Hospital performance varies widely throughout the country. Regional differences in the population's age and health, as well as differences in payment protocols, greatly affect hospitals' abilities to improve patient outcomes and build healthy business structures. The methodology of the 100 Top Hospitals studies helps to level the playing

field for some of the factors beyond a hospital's control by adjusting for patient severity, urban/rural geography, wage differences, and other factors. But in the end, regional variations in hospital performance are clear.

In this year's study, half of all the National study award winners were located in the Midwest. The South came in second, with 32 of the 100 winners. The West and Northeast were further behind, with 14 and 4 winners, respectively. (See Appendix A for a breakdown of all winners by state and region, and Appendix B for a list of all states in each region). But because the regions do not have equal numbers of hospitals, these numbers can be deceiving.

To demonstrate these differences more fairly, we prepared analysis that demonstrates state performance over the last two years of the 100 Top Hospitals: National Benchmarks study. To show performance by state, we ranked states and aggregated them into five equal groups (quintiles) based on their performance in this year's 100 Top Hospitals: National Benchmarks study versus other states. By assigning a color to each quintile, the map below (Figure 2) provides a visual representation of the variability in performance across the country for the current study year (2009).

Figure 2: 100 Top Hospitals: National Benchmarks, 2009 State-Level Performance Comparisons

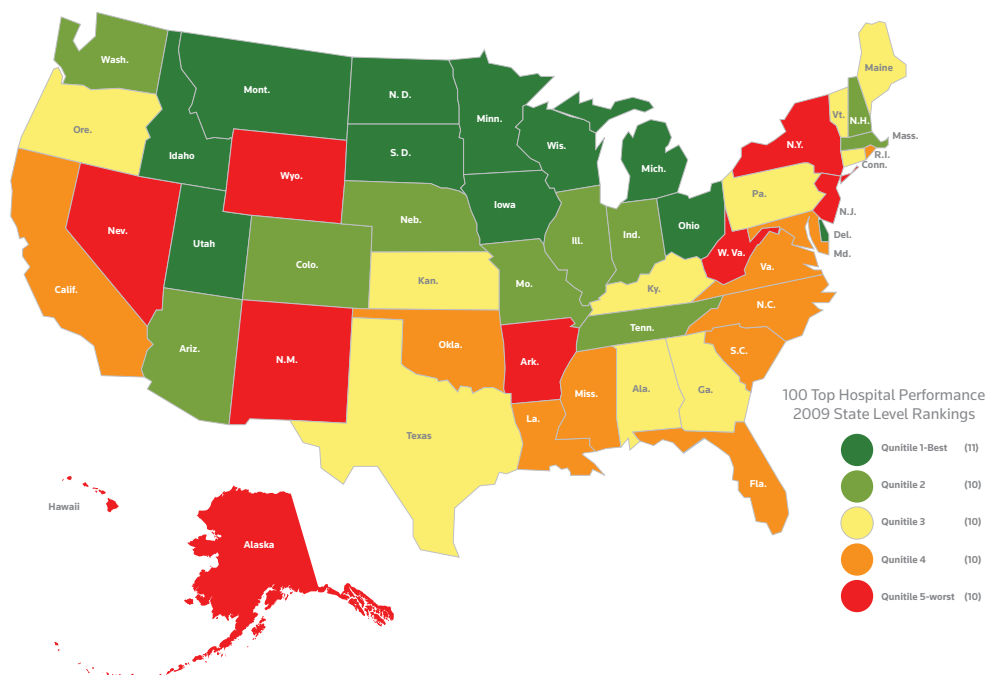


Table 2 shows each state's rank for the current and previous study years (2009 and 2008). This analysis allows us to observe geographic patterns in performance. Among our observations:

- In both the 2009 and 2008 studies, the Midwest was the clear front runner in performance versus peers. All but one (nearly 92 percent) of the states in this region were in the top-performing two quintiles both study years. No states in this region fell into the bottom two quintiles.
- Overall, almost two-thirds of all top-performing states (those in the best quintile) were located in the Midwest in 2009.

- The South showed the weakest performance overall, with nearly two-thirds of the region's states in the lowest-performing two quintiles in both the 2009 and 2008 study years.
- Overall, more states improved their performance rank between 2008 and 2009 than declined. Nearly 20 percent moved into a better quintile, while only 12 percent moved into a lower quintile (Table 2).

Table 2: 100 Top Hospitals: National Benchmarks, 2008 and 2009 State-Level Performance Comparisons

NORTHEAST		MIDWEST		SOUTH		WEST	
2009	2008	2009	2008	2009	2008	2009	2008
Connecticut	Connecticut	Illinois	Illinois	Alabama	Alabama	Alaska	Alaska
Maine	Maine	Indiana	Indiana	Arkansas	Arkansas	Arizona	Arizona
Massachusetts	Massachusetts	Iowa	Iowa	Delaware	Delaware	California	California
New Hampshire	New Hampshire	Kansas	Kansas	District of Columbia	District of Columbia	Colorado	Colorado
New Jersey	New Jersey	Michigan	Michigan	Florida	Florida	Hawaii	Hawaii
New York	New York	Minnesota	Minnesota	Georgia	Georgia	Idaho	Idaho
Pennsylvania	Pennsylvania	Missouri	Missouri	Kentucky	Kentucky	Montana	Montana
Rhode Island	Rhode Island	Nebraska	Nebraska	Louisiana	Louisiana	Nevada	Nevada
Vermont	Vermont	North Dakota	North Dakota	Maryland	Maryland	New Mexico	New Mexico
		Ohio	Ohio	Mississippi	Mississippi	Oregon	Oregon
		South Dakota	South Dakota	North Carolina	North Carolina	Utah	Utah
		Wisconsin	Wisconsin	Oklahoma	Oklahoma	Washington	Washington
				South Carolina	South Carolina	Wyoming	Wyoming
				Tennessee	Tennessee		
				Texas	Texas		
				Virginia	Virginia		
				West Virginia	West Virginia		

100 Top Hospital Performance
2009 State Level Rankings

- Quintile 1-Best (11)
- Quintile 2 (10)
- Quintile 3 (10)
- Quintile 4 (10)
- Quintile 5-worst (10)

A CLOSER LOOK AT THE 2009 NATIONAL BENCHMARKS AWARD WINNERS

In this section, we will show how the 100 Top Hospitals® performed within their comparison groups, or classes (major teaching and teaching hospitals; and large, medium, and small community hospitals), compared with non-winning peers. For performance measure details and definitions of each class, please see the Methodology section.

Below, data for the 100 Top Hospitals award winners are labeled Benchmark; data for all hospitals, excluding award winners, are labeled Peer Group. In columns labeled Benchmark Compared with Peer Group (Tables 3-8), we calculate the actual and percentage difference between the benchmark hospital scores and the peer group scores.

National Performance

Although they face the same pressures as their peers – rising patient care costs, labor shortages, constrained Medicare and Medicaid reimbursements, and a growing demand for public reporting, to name a few – the data outlined in Table 3 illustrate how the benchmark hospitals continue to outperform other hospitals.

Nationally, the 100 Top Hospitals show us that high quality patient outcomes can be achieved while keeping finances in line. For example, these hospitals had far better patient safety scores than their peers: The winners’ patient safety index of 0.87 means that they had 13 percent fewer adverse patient safety events than expected. In addition, the award winners had 6 percent fewer deaths than expected. Patients at the winning hospitals had better extended outcomes than patients at peer hospitals: Their 30-day mortality rate and 30-day readmission rates were lower. Finally, the winning hospitals’ higher Core Measures mean percent tells us that they had better adherence to recommended Core Measures of care than their peers.

The winning hospitals are more cost effective. The median expense per discharge at the winning hospitals was 11 percent lower than at peer hospitals. Combined with shorter patient stays, this translated into high profitability – winning hospitals had operating profit margins nearly four times the median for peer group hospitals. The winning hospitals’ hard work has not gone unnoticed: Their median HCAHPS scores show that patients in these hospitals are reporting a better overall hospital experience than those treated in peer hospitals (Table 3).

Table 3: National Performance Comparisons (All Classes)

PERFORMANCE MEASURE	MEDIANS ¹		BENCHMARK COMPARED WITH PEER GROUP		
	Current Benchmark	Peer Group of U.S. Hospitals	Actual	%	
Mortality Index ²	0.94	1.00	0.06	6.3%	lower mortality
Complications Index ²	0.96	0.99	0.03	3.4%	lower complications
Patient Safety Index ²	0.87	1.00	0.13	13.0%	better patient safety
Core Measures Mean Percent (%)	95.5	93.4	2.1	n/a ³	better Core Measure performance
30-Day Mortality Rate (%)	12.3	13.0	0.7	n/a ³	lower 30-day mortality
30-Day Readmission Rate (%)	20.4	20.8	0.5	n/a ³	lower 30-day readmissions
Average Length of Stay (days)	4.69	5.16	0.48	9.2%	shorter ALOS
Expense per Adjusted Discharge (\$)	5,359	6,022	663	11.0%	lower expenses
Operating Profit Margin (%)	9.1	2.4	6.7	n/a ³	higher profitability
HCAHPS Score	263	253	10	4.0%	higher hospital rating

1. Data are as of 2008 unless otherwise noted. Median values reflect rounding. Performance measure definitions can be found in the Methodology section.
2. Based on national norms; ratings greater than 1.0 indicate more adverse events than expected, ratings less than 1.0 indicate fewer. See Appendix C for more details.
3. We do not calculate percentage difference for this measure. See Appendix C for an explanation.

Major Teaching Hospital Performance

All teaching hospitals face unique challenges – the largest and most specialized, even more so. Major teaching hospitals treat more complex cases, offer a wider array of services, and expend more resources to do so. In addition, the complex case load makes it much more challenging to manage lengths of stay. For these reasons, the differences between the major teaching hospital benchmark and peer medians are generally more modest than those in the other classes of hospitals.

With all these challenges, the gains the benchmark major teaching hospitals have been able to make are worth striving to emulate. Their patient safety rates were substantially lower than their

peers – they had 9 percent fewer adverse patient safety events than expected (Table 4). Their Core Measures mean percent was higher, indicating superior patient safety and publicly reported process of care measures. The median average length of stay was more than three-quarters of a day shorter than their peers'. In addition, the benchmark major teaching hospitals are clearly financially healthier than their peers, with 11 percent lower expenses, and profit margins nearly five times higher. Finally, major teaching hospitals had the best performance on 30-day mortality of all the hospital comparison groups. This may be an indication that they provide better in-hospital care, case management, and/or discharge processing, resulting in more stable discharged patients.

Table 4: Major Teaching Hospital Performance Comparisons

PERFORMANCE MEASURE	MEDIAN ¹		BENCHMARK COMPARED WITH PEER GROUP		
	Current Benchmark	Peer Group of U.S. Hospitals	Actual	%	
Mortality Index ²	0.98	1.01	0.03	2.94%	lower mortality
Complications Index ²	0.97	0.99	0.02	2.15%	lower complications
Patient Safety Index ²	0.91	1.00	0.09	9.32%	better patient safety
Core Measures Mean Percent (%)	95.3	92.8	2.5	n/a ³	better Core Measure performance
30-Day Mortality Rate (%)	11.9	12.5	0.6	n/a ³	lower 30-day mortality
30-Day Readmission Rate (%)	22.0	21.8	0.2	n/a ³	higher 30-day readmissions
Average Length of Stay (days)	4.48	5.25	0.77	14.71%	shorter ALOS
Expense per Adjusted Discharge (\$)	7,829	8,802	974	11.06%	lower expenses
Operating Profit Margin (%)	5.0	1.1	3.9	n/a ³	higher profitability
HCAHPS Score	260	252	8	3.17%	higher hospital rating

1. Data are as of 2008 unless otherwise noted. Median values reflect rounding. Performance measure definitions can be found in the Methodology section.
2. Based on national norms; ratings greater than 1.0 indicate more adverse events than expected, ratings less than 1.0 indicate fewer. See Appendix C for more details.
3. We do not calculate percentage difference for this measure. See Appendix C for an explanation.

Teaching Hospital Performance

Despite the challenges they face, the teaching 100 Top Hospitals® (Table 5) are setting impressive benchmarks in a number of areas. These hospitals had 8 percent fewer adverse patient safety events than expected. Their average patient stay was nearly two-thirds of a day shorter. Lower expenses were another hallmark of this year's group of benchmark teaching hospitals. The ability of management to control expenses

contributed greatly to the teaching 100 Top Hospitals' profit margins, which were more than three times higher than that of their peers. Finally, of all the comparison groups we studied, the teaching hospital winners, together with the small community hospitals, achieved the best performance on patients' overall rating of the hospital (HCAHPS score) compared with all other classes of hospitals.

Table 5: Teaching Hospital Performance Comparisons

PERFORMANCE MEASURE	MEDIANS ¹		BENCHMARK COMPARED WITH PEER GROUP		
	Current Benchmark	Peer Group of U.S. Hospitals	Actual	%	
Mortality Index ²	0.97	1.00	0.03	3.10%	lower mortality
Complications Index ²	0.97	1.00	0.03	2.58%	lower complications
Patient Safety Index ²	0.92	1.02	0.09	9.14%	better patient safety
Core Measures Mean Percent (%)	95.4	93.8	1.6	n/a ³	better Core Measure performance
30-Day Mortality Rate (%)	12.0	12.5	0.5	n/a ³	lower 30-day mortality
30-Day Readmission Rate (%)	19.9	20.7	0.8	n/a ³	lower 30-day readmissions
Average Length of Stay (days)	4.69	5.30	0.61	11.53%	shorter ALOS
Expense per Adjusted Discharge (\$)	5,691	6,535	844	12.91%	lower expenses
Operating Profit Margin (%)	8.8	2.5	6.2	n/a ³	higher profitability
HCAHPS Score	265	252	13	5.16%	higher hospital rating

1. Data are as of 2008 unless otherwise noted. Median values reflect rounding. Performance measure definitions can be found in the Methodology section.
2. Based on national norms; ratings greater than 1.0 indicate more adverse events than expected, ratings less than 1.0 indicate fewer. See Appendix C for more details.
3. We do not calculate percentage difference for this measure. See Appendix C for an explanation.

Large Community Hospital Performance

Large community hospitals face their own set of unique difficulties. They are often located in urban areas and treat a wider array of patient conditions than do medium and smaller hospitals. Despite these challenges, large community hospitals outperformed their peers by 14 percent on patient

safety, had 18 percent lower expenses, and had a median patient stay that was more than two-thirds a day shorter than their peers. Finally, their 30-day readmission rates were substantially lower than their peers (Table 6), as well as being the lowest of all hospital comparison groups.

Table 6: Large Community Hospital Performance Comparisons

PERFORMANCE MEASURE	MEDIANS ¹		BENCHMARK COMPARED WITH PEER GROUP		
	Current Benchmark	Peer Group of U.S. Hospitals	Actual	%	
Mortality Index ²	0.95	1.00	0.06	5.51%	lower mortality
Complications Index ²	0.97	1.00	0.03	2.86%	lower complications
Patient Safety Index ²	0.86	1.01	0.14	14.26%	better patient safety
Core Measures Mean Percent (%)	95.0	93.4	1.6	n/a ³	better Core Measure performance
30-Day Mortality Rate (%)	12.1	12.6	0.5	n/a ³	lower 30-day mortality
30-Day Readmission Rate (%)	19.7	20.7	1.0	n/a ³	lower 30-day readmissions
Average Length of Stay (days)	4.68	5.37	0.69	12.79%	shorter ALOS
Expense per Adjusted Discharge (\$)	5,069	6,158	1,089	17.69%	lower expenses
Operating Profit Margin (%)	7.4	3.7	3.7	n/a ³	higher profitability
HCAHPS Score	262	252	10	3.97%	higher hospital rating

1. Data are as of 2008 unless otherwise noted. Median values reflect rounding. Performance measure definitions can be found in the Methodology section.
2. Based on national norms; ratings greater than 1.0 indicate more adverse events than expected, ratings less than 1.0 indicate fewer. See Appendix C for more details.
3. We do not calculate percentage difference for this measure. See Appendix C for an explanation.

Medium Community Hospital Performance

Again this year, both the small and medium community benchmark hospitals posted the most impressive results of all the comparison groups – both in the margins by which they outperformed their peers and in their scores on several measures when compared with the other hospital classes. Clearly these hospitals are setting admirable standards for their peers and are showing an ability to adapt to the demands of a changing healthcare market, in some cases more quickly than the large community and teaching hospitals.

With regard to patient outcomes, the medium community 100 Top Hospitals® had 20 percent fewer adverse patient safety events than expected given their patient mix, while their peers had nearly as many as expected. They had 8 percent fewer

mortalities and 5 percent fewer complications than expected, whereas their peers had about as many mortalities and complications as expected (Table 7).

Benchmark hospitals in the medium and small community hospital classes outperformed their peers in Core Measures by wider margins than any other comparison group. This means that these hospitals bettered their peers in terms of adherence to the publicly reported clinical process measures for patients with heart attacks, heart failure, pneumonia, and for surgical infection prevention. The medium-sized and small community benchmark hospitals were the most efficient in our study, with the lowest expenses and the shortest lengths of stay.

Table 7: Medium Community Hospital Performance Comparisons

PERFORMANCE MEASURE	MEDIANS ¹		BENCHMARK COMPARED WITH PEER GROUP		
	Current Benchmark	Peer Group of U.S. Hospitals	Actual	%	
Mortality Index ²	0.91	1.00	0.08	8.48%	lower mortality
Complications Index ²	0.94	0.99	0.05	5.42%	lower complications
Patient Safety Index ²	0.79	0.99	0.20	19.85%	better patient safety
Core Measures Mean Percent (%)	96.2	93.4	2.8	n/a ³	better Core Measure performance
30-Day Mortality Rate (%)	12.6	12.9	0.4	n/a ³	lower 30-day mortality
30-Day Readmission Rate (%)	20.4	20.9	0.5	n/a ³	lower 30-day readmissions
Average Length of Stay (days)	4.38	5.31	0.93	17.47%	shorter ALOS
Expense per Adjusted Discharge (\$)	5,034	5,854	820	14.01%	lower expenses
Operating Profit Margin (%)	11.2	2.9	8.2	n/a ³	higher profitability
HCAHPS Score	264	251	13	5.18%	higher hospital rating

1. Data are as of 2008 unless otherwise noted. Median values reflect rounding. Performance measure definitions can be found in the Methodology section.

2. Based on national norms; ratings greater than 1.0 indicate more adverse events than expected, ratings less than 1.0 indicate fewer. See Appendix C for more details.

3. We do not calculate percentage difference for this measure. See Appendix C for an explanation.

Small Community Hospital Performance

The small community award winners showed wide differences in performance compared with their peers. In the patient outcomes measures, this variance was the widest of any comparison group (Table 8). The small benchmark hospitals' patient safety index score – which shows they are having 35 percent fewer adverse safety events than expected – was the lowest of any hospital comparison group and the widest gap versus peer. Their median mortality and complications

indices were also impressive, both 11 percent lower than those of their peers. The small community benchmark hospitals are managing their finances well and running efficient operations. Their median expense per discharge was 15 percent lower than their peers', and the typical winning hospital's operating profit margin was an impressive 10 times that of their peers. In fact, small community benchmark hospitals have the largest operating profit margin of all comparison groups.

Table 8: Small Community Hospital Performance Comparisons

PERFORMANCE MEASURE	MEDIANS ¹		BENCHMARK COMPARED WITH PEER GROUP		
	Current Benchmark	Peer Group of U.S. Hospitals	Actual	%	
Mortality Index ²	0.89	1.00	0.12	11.48%	lower mortality
Complications Index ²	0.87	0.98	0.10	10.61%	lower complications
Patient Safety Index ²	0.65	1.00	0.35	35.03%	better patient safety
Core Measures Mean Percent (%)	96.0	93.3	2.7	n/a ³	better Core Measure performance
30-Day Mortality Rate (%)	12.8	13.3	0.5	n/a ³	lower 30-day mortality
30-Day Readmission Rate (%)	20.3	20.8	0.5	n/a ³	lower 30-day readmissions
Average Length of Stay (days)	4.29	5.27	0.98	18.58%	shorter ALOS
Expense per Adjusted Discharge (\$)	4,793	5,616	823	14.66%	lower expenses
Operating Profit Margin (%)	15.9	1.6	14.4	n/a ³	higher profitability
HCAHPS Score	265	256	9	3.32%	higher hospital rating

1. Data are as of 2008 unless otherwise noted. Median values reflect rounding. Performance measure definitions can be found in the Methodology section.
2. Based on national norms; ratings greater than 1.0 indicate more adverse events than expected, ratings less than 1.0 indicate fewer. See Appendix C for more details.
3. We do not calculate percentage difference for this measure. See Appendix C for an explanation.

100 TOP HOSPITALS AND PERFORMANCE IMPROVEMENT

To date, the healthcare industry, as a whole, has not been able to significantly improve performance across the balanced scorecard of measures. The single outstanding achievement in performance improvement by hospitals is the improvement in mortality rates over the years we studied (2004 through 2008). More than half of the hospitals studied had improved survival rates (lower mortality indices), which is outstanding. The second clear accomplishment is in average length of stay (Table 9), where 31 percent of hospitals studied decreased their average patient stay despite industry-wide increases in patient acuity.

For the remainder of the measures, except the complications index, the majority of hospitals in the study had no statistically significant change in performance (see yellow column of Table 9). For patient complications, more than a quarter of the hospitals had significantly declining performance – meaning the number of complications that would be expected, given patient condition, has increased. This may be a documentation phenomenon – due to increased awareness among hospitals of the need for accurate and complete coding of complications.

Financially, most hospitals were just trading water – 87 percent showed no marked change in

profitability and more than 7 percent experienced a significant decline. In fact, our previously reviewed finding showed that 33 percent of in-study hospitals now have a negative operating profit margin (Table 1).

On the operating efficiency front, two-thirds of the hospitals have not significantly decreased their expense per adjusted discharge; the other third have seen an increase in expense per discharge. Given these statistics, it is clear that healthcare executives are facing great challenges in aligning their organizations for continuous performance improvement. The hospitals that accomplish this feat while achieving top current performance – the Everest award winners – are truly setting high benchmarks for the industry.

For more details, the line graphs on the following pages provide a clear view of how the hospitals in our study that had the fastest, most consistent five-year performance compared with their peers on each study performance measure. Although we do not name the hospitals with the best five-year performance improvement, we do use this group to help select the Everest award winners.

The peer and benchmark lines represent the best-fit straight line through the data over the five years studied, showing the direction of performance over time.

Table 9: Direction of Performance Change for All Hospitals in Study, 2004–2008

PERFORMANCE MEASURE	SIGNIFICANTLY IMPROVING PERFORMANCE		NO STATISTICALLY SIGNIFICANT CHANGE IN PERFORMANCE		SIGNIFICANTLY DECLINING PERFORMANCE	
	Count of Hospitals ¹	Percent of Hospitals ²	Count of Hospitals ¹	Percent of Hospitals ²	Count of Hospitals ¹	Percent of Hospitals ²
Risk-Adjusted Mortality Index	1,472	51.9	1,327	46.8	36	1.3
Risk-Adjusted Complications Index	143	5.0	1,917	67.6	775	27.3
Patient Safety Index	315	11.2	2,330	83.1	158	5.6
Core Measures Mean Percent	2,480	87.5	335	12.5	0	0
Severity-Adjusted Average Length of Stay	885	31.2	1,884	66.5	66	2.3
Expense per Adjusted Discharge	33	1.2	1,857	66.1	921	32.8
Operating Profit Margin	158	5.6	2,455	87.2	202	7.2

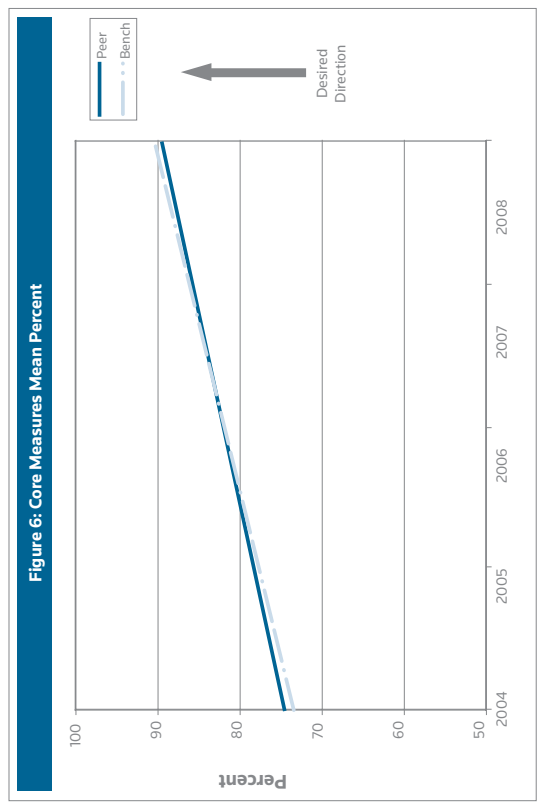
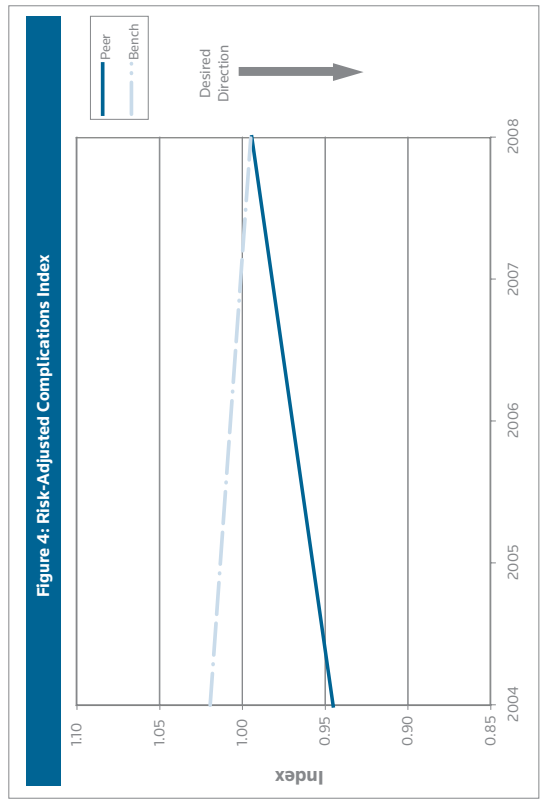
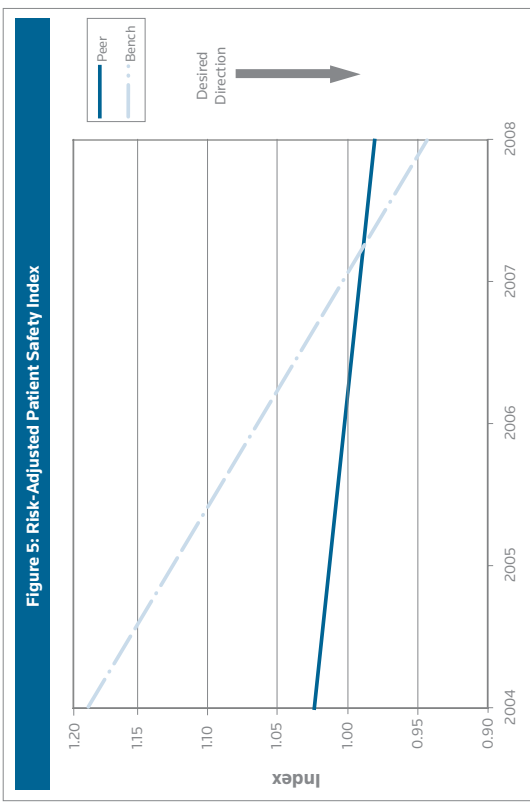
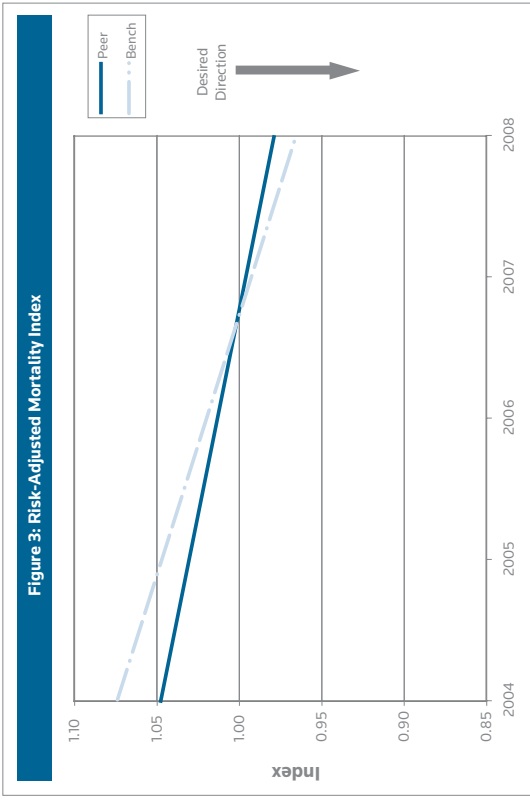
1. *Count* refers to the number of hospitals in the study whose performance fell into the highlighted category on the measure.

2. *Percent* is of total in-study hospitals across all peer groups.

Note: All calculations exclude outlier values. Differences may occur due to rounding.

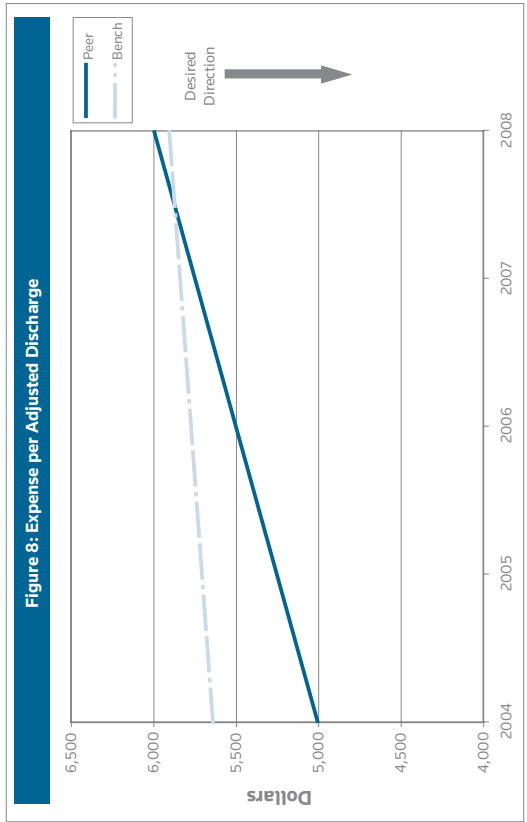
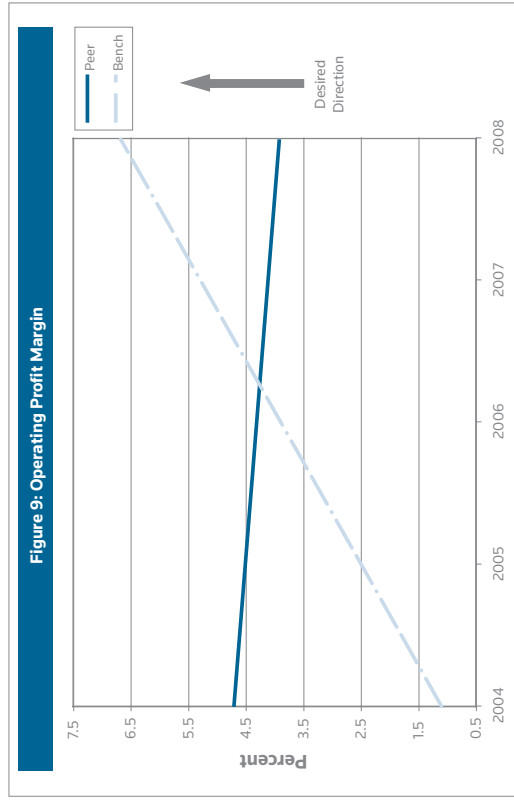
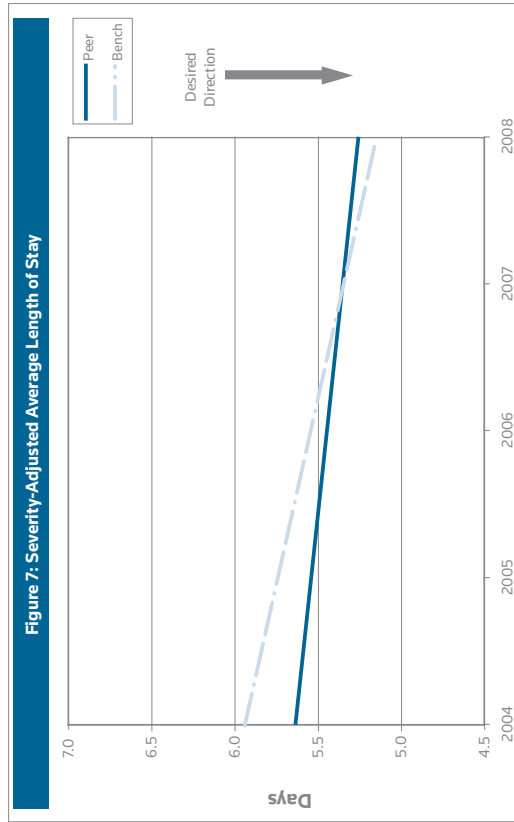
Figures 3-6 show how the benchmark hospitals have made consistent improvement on clinical measures – lowering patient mortality and complications, reducing adverse safety events,

and performing well on Core Measures. Peer group hospitals, on the other hand, did not show consistent improvement across all clinical measures.



Figures 7-9 demonstrate how the hospitals in our study with the fastest, most consistent five-year improvement rates have improved their efficiency and financial position – by keeping expense increases dramatically below those of their peers,

increasing profitability, and shortening patient stays. Peer group hospitals did not show such consistent improvement across the financial measures.



100 TOP HOSPITALS: NATIONAL BENCHMARKS, 1993-2009*

HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
NorthShore University HealthSystem	Evanston, IL	1994-2002, 2004-2005, 2007-2009	14
Advocate Lutheran General Hospital	Park Ridge, IL	1995-1996, 1998-2005, 2008-2009	12
Munson Medical Center	Traverse City, MI	1993, 1997-2001, 2004-2009	12
Brigham and Women's Hospital	Boston, MA	1993-2001, 2004, 2006	11
EMH Regional Medical Center	Elyria, OH	1993-1994, 1998, 2000-2007	11
Hillcrest Hospital	Mayfield Heights, OH	1995-1996, 1998-2003, 2006-2008	11
Vanderbilt University Medical Center	Nashville, TN	1999-2009	11
Licking Memorial Hospital	Newark, OH	1998-2003, 2005-2008	10
Providence St. Vincent Medical Center	Portland, OR	1993-1994, 1998-2003, 2005, 2008	10
Lancaster General Hospital	Lancaster, PA	1997-2001, 2003, 2005-2008	10
Blake Medical Center	Bradenton, FL	1995, 1997-2003, 2005	9
Mayo Clinic-Rochester Methodist Hospital	Rochester, MN	1994-1997, 1999, 2001-2002, 2005, 2009	9
Saint Thomas Hospital	Nashville, TN	1993-1995, 1998-1999, 2001, 2006, 2008-2009	9
North Florida Regional Medical Center	Gainesville, FL	1994-1995, 1997-2002	8
Beth Israel Deaconess Medical Center	Boston, MA	1994-1997, 2005-2008	8
St. Cloud Hospital	St. Cloud, MN	1993-1994, 1999, 2005-2009	8
Riverside Methodist Hospital	Columbus, OH	2001-2006, 2008-2009	8
Sanford USD Medical Center	Sioux Falls, SD	1993-1994, 2003-2007, 2009	8
University of Virginia Medical Center	Charlottesville, VA	1998-2002, 2004-2005, 2008	8
Inova Fairfax Hospital	Falls Church, VA	1993, 1995, 1997-2001, 2003	8
Exempla Lutheran Medical Center	Wheat Ridge, CO	1993-1994, 1996, 1998, 2001-2002, 2005	7
Saint Francis Hospital and Medical Center	Hartford, CT	1997-1998, 2000-2004	7
Regional Medical Center Bayonet Point	Hudson, FL	1995, 1998-2003	7
Mease Countryside Hospital	Safety Harbor, FL	1997, 1999-2001, 2003-2004, 2007	7
St. Luke's Boise Medical Center	Boise, ID	1993-1995, 2004, 2007-2009	7
Mercy Medical Center-North Iowa	Mason City, IA	2001-2004, 2006-2008	7
University of Michigan Hospitals & Health Centers	Ann Arbor, MI	1993-1994, 2004-2008	7
Spectrum Health Hospital Group	Grand Rapids, MI	1994-1995, 1998-2000, 2007, 2009	7
William Beaumont Hospital-Troy	Troy, MI	1998-1999, 2002-2006	7
Mercy Hospital Anderson	Cincinnati, OH	1999-2000, 2002-2003, 2005-2007	7
Cleveland Clinic Foundation	Cleveland, OH	1994-1998, 2000-2001	7
York Hospital	York, PA	1997-2001, 2004-2005	7
Memorial Health Care System	Chattanooga, TN	1998, 2004-2009	7
Scott and White Memorial Hospital	Temple, TX	2003-2009	7
Castleview Hospital	Price, UT	1994-1996, 1998-2000, 2008	7
St. Joseph Medical Center	Tacoma, WA	1994-1999, 2001	7
Chambers Memorial Hospital	Danville, AR	2003-2008	6

* Hospitals are organized by total years won, then by state, city, and hospital name.

HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
Poudre Valley Hospital	Fort Collins, CO	1994, 2003–2007	6
Palmetto General Hospital	Hialeah, FL	1997–2001, 2003	6
Leesburg Regional Medical Center	Leesburg, FL	1996–2001	6
Kendall Regional Medical Center	Miami, FL	1995–1998, 2001, 2007	6
Community Hospital	New Port Richey, FL	1995–1998, 2000–2001	6
Silver Cross Hospital	Joliet, IL	2004–2009	6
Newton–Wellesley Hospital	Newton, MA	1994, 2001, 2003–2006	6
William Beaumont Hospital–Royal Oak	Royal Oak, MI	1997–2001, 2003	6
St. Luke's Hospital	Chesterfield, MO	1996, 2000–2002, 2004–2005	6
Kettering Medical Center	Kettering, OH	2000–2001, 2004–2007	6
Southwest General Health Center	Middleburg Heights, OH	1993, 2005–2009	6
Medical Center of Southeastern Oklahoma	Durant, OK	1995–2000	6
Geisinger Medical Center	Danville, PA	1997–1998, 2001, 2005–2006, 2009	6
DuBois Regional Medical Center	DuBois, PA	1993, 2001, 2003–2004, 2006, 2009	6
DeKalb Community Hospital	Smithville, TN	1995–1996, 1998–2001	6
Harris Methodist Fort Worth	Fort Worth, TX	1994–1999	6
Southwest Washington Medical Center	Vancouver, WA	1994, 1999–2000, 2002, 2005–2006	6
Appleton Medical Center	Appleton, WI	1994, 1999–2003	6
St. Joseph's Hospital and Medical Center	Phoenix, AZ	2001–2002, 2004, 2007–2008	5
University Medical Center	Tucson, AZ	2005–2009	5
Desert Valley Hospital	Victorville, CA	2003, 2005–2006, 2008–2009	5
Exempla Saint Joseph Hospital	Denver, CO	1993–1994, 1997, 1999, 2002	5
Rose Medical Center	Denver, CO	2001–2002, 2007–2009	5
Aventura Hospital and Medical Center	Aventura, FL	1995–1997, 1999–2000	5
Brandon Regional Hospital	Brandon, FL	1995–1997, 1999–2000	5
Morton Plant Hospital	Clearwater, FL	1999–2001, 2003–2004	5
Southwest Florida Regional Medical Center	Fort Myers, FL	1996–1997, 2001, 2003, 2005	5
Largo Medical Center	Largo, FL	1994–1995, 1997, 2000, 2005	5
Martin Memorial Medical Center	Stuart, FL	1998–1999, 2001–2002, 2009	5
Piedmont Fayette Hospital	Fayetteville, GA	2003–2006, 2009	5
WellStar Kennestone Hospital	Marietta, GA	1993, 1998–2001	5
Northwestern Memorial Hospital	Chicago, IL	1997–1998, 2001, 2008–2009	5
King's Daughters Medical Center	Ashland, KY	2004–2008	5
St. Elizabeth Medical Center	Edgewood, KY	1997, 2006–2009	5
University of Kentucky Albert B. Chandler Hospital	Lexington, KY	1993–1995, 2006–2007	5
Baptist Hospital East	Louisville, KY	2004–2008	5
Meadowview Regional Medical Center	Maysville, KY	1995, 1998–1999, 2001–2002	5
Beverly Hospital	Beverly, MA	2000–2002, 2005–2006	5
Cape Cod Hospital	Hyannis, MA	1997–1999, 2001, 2005	5
Spectrum Health Hospital Group (Blodgett Hospital)	Grand Rapids, MI	1994–1997, 2001	5
Holland Hospital	Holland, MI	2005–2009	5
Mayo Clinic–Saint Marys Hospital	Rochester, MN	1994, 2002–2004, 2008	5
St. John's Mercy Hospital	Washington, MO	1995, 1998–2000, 2002	5
Saint Elizabeth Regional Medical Center	Lincoln, NE	1993, 2003–2004, 2006, 2008	5

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
The Christ Hospital	Cincinnati, OH	1993, 1995, 1998, 2000–2001	5
University Hospitals Case Medical Center	Cleveland, OH	2005–2009	5
Ohio State University Medical Center	Columbus, OH	1993–1995, 2000, 2002	5
Jamestown Regional Medical Center	Jamestown, TN	1995–1998, 2002	5
American Fork Hospital	American Fork, UT	1994, 1997–1999, 2009	5
Valley View Medical Center	Cedar City, UT	1998–2002	5
St. Mark's Hospital	Salt Lake City, UT	1994, 2001–2003, 2005	5
Providence Regional Medical Center Everett	Everett, WA	1993–1994, 2005, 2007–2008	5
St. Francis Hospital	Federal Way, WA	1999–2003	5
Theda Clark Medical Center	Neenah, WI	1993, 1999–2001, 2003	5
Northwest Medical Center	Tucson, AZ	2002–2004, 2007	4
Pomona Valley Hospital Medical Center	Pomona, CA	1996, 1998–2000	4
St. Elizabeth Community Hospital	Red Bluff, CA	2006–2009	4
UCSF Medical Center	San Francisco, CA	1994–1997	4
Torrance Memorial Medical Center	Torrance, CA	1993–1995, 2004	4
Hartford Hospital	Hartford, CT	1996–1998, 2000	4
JFK Medical Center	Atlantis, FL	1995, 2000–2001, 2003	4
Delray Medical Center	Delray Beach, FL	2001–2004	4
Lee Memorial Health System	Fort Myers, FL	1994, 2002–2004	4
Memorial Hospital of Jacksonville	Jacksonville, FL	1997–2000	4
Palms West Hospital	Loxahatchee, FL	1995, 2000–2002	4
Wellington Regional Medical Center	Wellington, FL	2002–2005	4
Shelby Memorial Hospital	Shelbyville, IL	1998–2000, 2005	4
Central DuPage Hospital	Winfield, IL	2006–2009	4
St. Vincent Indianapolis Hospital	Indianapolis, IN	1998–1999, 2008–2009	4
Flaget Memorial Hospital	Bardstown, KY	2004–2007	4
Washington County Health System	Hagerstown, MD	1997–1998, 2000, 2002	4
Milford Regional Medical Center	Milford, MA	1999–2002	4
Gerber Memorial Health Services	Fremont, MI	1993, 1999, 2004–2005	4
Allegiance Health	Jackson, MI	1995–1996, 2007, 2009	4
Saint Joseph Mercy Saline Hospital	Saline, MI	2006–2009	4
Providence Hospital and Medical Center	Southfield, MI	1996, 2007–2009	4
St. Mary's Medical Center	Duluth, MN	1994–1995, 1997, 1999	4
Lakeview Hospital	Stillwater, MN	2003, 2006–2008	4
Albany Medical Center	Albany, NY	1994, 1997–1999	4
Carolinas Medical Center–NorthEast	Concord, NC	2001–2004	4
Summa Health System	Akron, OH	2001–2002, 2004–2005	4
Mercy Hospital Clermont	Batavia, OH	2002, 2006, 2008–2009	4
Aultman Hospital	Canton, OH	1998–2000, 2009	4
Bethesda North Hospital	Cincinnati, OH	2004–2007	4
University Hospital	Cincinnati, OH	1993, 1995, 2001, 2003	4
St. Charles Medical Center–Bend	Bend, OR	1993–1994, 2001, 2005	4
Providence Portland Medical Center	Portland, OR	1993–1994, 1999–2000	4
Hamot Medical Center	Erie, PA	2000, 2005, 2008–2009	4
The Western Pennsylvania Hospital	Pittsburgh, PA	2001–2003, 2008	4

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
Robert Packer Hospital	Sayre, PA	2006-2009	4
UPMC Northwest	Seneca, PA	2001-2004	4
Avera McKennan Hospital & University Health Center	Sioux Falls, SD	2006-2009	4
Hendersonville Medical Center	Hendersonville, TN	1995-1996, 2000-2001	4
Baptist Hospital of East Tennessee	Knoxville, TN	1997-2000	4
Baptist Hospital	Nashville, TN	1995, 1998, 2001, 2009	4
Brackenridge Hospital	Austin, TX	1996, 2001-2003	4
East Texas Medical Center Tyler	Tyler, TX	1997-1998, 2003, 2005	4
Clear Lake Regional Medical Center	Webster, TX	1996-1999	4
St. Clare Hospital	Lakewood, WA	1999, 2001-2003	4
Bellin Hospital	Green Bay, WI	1993, 1999, 2001-2002	4
Gundersen Lutheran Health System	La Crosse, WI	1997, 2007-2009	4
University of Wisconsin Hospital and Clinics	Madison, WI	1993, 2002, 2004, 2006	4
Paradise Valley Hospital	Phoenix, AZ	1997, 2000, 2006	3
Mt. Graham Regional Medical Center	Safford, AZ	1995-1997	3
Wickenburg Regional Health Center	Wickenburg, AZ	1994-1996	3
Tri-City Medical Center	Oceanside, CA	1994-1996	3
Scripps Green Hospital	La Jolla, CA	2004-2005, 2009	3
St. Anthony North Hospital	Westminster, CO	1997-1998, 2001	3
Danbury Hospital	Danbury, CT	2004-2006	3
Middlesex Hospital	Middletown, CT	2004, 2007-2008	3
Yale-New Haven Hospital	New Haven, CT	2003-2004, 2006	3
St. Vincent's Medical Center	Jacksonville, FL	1994-1996	3
Baptist Hospital of Miami	Miami, FL	1999, 2001-2002	3
Orange Park Medical Center	Orange Park, FL	1996, 2001-2002	3
Orlando Regional Medical Center	Orlando, FL	1995-1996, 1998	3
Cleveland Clinic Florida	Weston, FL	2005, 2008-2009	3
WellStar Douglas Hospital	Douglasville, GA	1999-2001	3
Fairview Park Hospital	Dublin, GA	2000-2002	3
Meadows Regional Medical Center	Vidalia, GA	2005-2006, 2008	3
Memorial Hospital of Carbondale	Carbondale, IL	2004-2006	3
Riverside Medical Center	Kankakee, IL	2007-2009	3
Centegra Northern Illinois Medical Center	McHenry, IL	2005-2007	3
Crossroads Community Hospital	Mount Vernon, IL	1996-1998	3
Advocate Christ Medical Center	Oak Lawn, IL	1998-2000	3
St. Mary's Medical Center	Evansville, IN	1994-1996	3
Wishard Health Services	Indianapolis, IN	1993-1995	3
Marion General Hospital	Marion, IN	1993, 2007-2008	3
St. Luke's Hospital	Cedar Rapids, IA	2004-2005, 2009	3
Shawnee Mission Medical Center	Shawnee Mission, KS	2002, 2004-2005	3
Georgetown Community Hospital	Georgetown, KY	1997-1998, 2002	3
Kentucky River Medical Center	Jackson, KY	2001-2002, 2005	3
Saint Joseph East	Lexington, KY	2005, 2007-2008	3
Whitesburg ARH	Whitesburg, KY	1993, 2001-2002	3
Baystate Medical Center	Springfield, MA	1999, 2001, 2006	3

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
St. Joseph Mercy Hospital	Ann Arbor, MI	1996, 1999, 2009	3
St. John Hospital & Medical Center	Detroit, MI	2005–2007	3
Otsego Memorial Hospital	Gaylord, MI	1999–2000, 2002	3
Spectrum Health United Memorial	Greenville, MI	1997–1998, 2000	3
St. Mary Mercy Livonia Hospital	Livonia, MI	2006–2008	3
MidMichigan Medical Center-Midland	Midland, MI	2006–2008	3
Metro Health Hospital	Wyoming, MI	2006–2008	3
Buffalo Hospital	Buffalo, MN	1996, 1999, 2009	3
Fairview Ridges Hospital	Burnsville, MN	1993, 1998, 2001	3
St. John's Hospital	Maplewood, MN	1994, 2003–2004	3
St. John's Hospital	Springfield, MO	1993–1994, 2004	3
St. John's Mercy Medical Center	St. Louis, MO	1998–2000	3
Alegent Health Bergan Mercy Medical Center	Omaha, NE	2001, 2008–2009	3
Speare Memorial Hospital	Plymouth, NH	2002–2004	3
Staten Island University Hospital	Staten Island, NY	1996–1998	3
Mission Hospitals	Asheville, NC	1994, 2003–2004	3
FirstHealth Moore Regional Hospital	Pinehurst, NC	1995, 2003–2004	3
Heritage Hospital	Tarboro, NC	1995–1997	3
Akron General Medical Center	Akron, OH	1996, 2001–2002	3
Fairview Hospital	Cleveland, OH	2005–2007	3
Grant Medical Center	Columbus, OH	1996–1997, 2004	3
Grandview Medical Center	Dayton, OH	2001, 2005, 2007	3
Sycamore Medical Center	Miamisburg, OH	2006–2008	3
Mercy Medical Center	Springfield, OH	1996, 2002, 2004	3
Wooster Community Hospital	Wooster, OH	2007–2009	3
Duncan Regional Hospital	Duncan, OK	2005, 2007–2008	3
Willamette Valley Medical Center	McMinnville, OR	1995–1997	3
Providence Milwaukie Hospital	Milwaukie, OR	1994, 2001, 2003	3
UPMC Bedford Memorial	Everett, PA	1994, 2001–2002	3
Thomas Jefferson University Hospital	Philadelphia, PA	1997, 2000–2001	3
Riverview Regional Medical Center–South Campus	Carthage, TN	1996–1997, 2003	3
Maury Regional Hospital	Columbia, TN	1993, 2007, 2009	3
Copper Basin Medical Center	Copperhill, TN	1995, 1997, 2001	3
Trinity Hospital	Erin, TN	1997, 2002, 2005	3
Centennial Medical Center	Nashville, TN	1997, 2007–2008	3
Harris Methodist Walls Regional Hospital	Cleburne, TX	1994–1995, 1998	3
Parkland Health & Hospital System	Dallas, TX	2000, 2002, 2007	3
Doctors Hospital at Renaissance	Edinburg, TX	2007–2009	3
Thomason Hospital	El Paso, TX	1995–1996, 2007	3
Houston Northwest Medical Center	Houston, TX	2000–2002	3
McAllen Medical Center	McAllen, TX	1997–1999	3
Lake Pointe Medical Center	Rowlett, TX	1996, 2001, 2003	3
University Health System	San Antonio, TX	1997, 2003–2004	3
Citizens Medical Center	Victoria, TX	2006–2008	3
Lake Whitney Medical Center	Whitney, TX	2007–2009	3

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
Brigham City Community Hospital	Brigham City, UT	1995–1996, 2007	3
Cottonwood Hospital	Murray, UT	1993, 1999–2000	3
Alta View Hospital	Sandy, UT	1993, 1996, 1998	3
Winchester Medical Center	Winchester, VA	1994, 2005–2006	3
New London Family Medical Center	New London, WI	1995–1996, 2000	3
Sauk Prairie Memorial Hospital & Clinics	Prairie du Sac, WI	2000, 2003–2004	3
Aurora Sheboygan Memorial Medical Center	Sheboygan, WI	2007–2009	3
Andalusia Regional Hospital	Andalusia, AL	2005, 2007	2
Banner Mesa Medical Center	Mesa, AZ	1995–1996	2
Payson Regional Medical Center	Payson, AZ	2006, 2009	2
Scottsdale Healthcare Shea	Scottsdale, AZ	2004, 2009	2
Carondelet St. Mary's Hospital	Tucson, AZ	2002, 2004	2
Carondelet St. Joseph's Hospital	Tucson, AZ	2001–2002	2
Tucson Medical Center	Tucson, AZ	1995, 2004	2
Barstow Community Hospital	Barstow, CA	1996–1997	2
Mills–Peninsula Health Services	Burlingame, CA	1998–1999	2
Mercy San Juan Medical Center	Carmichael, CA	2006–2007	2
Community & Mission Hospitals of Huntington Park	Huntington Park, CA	1996–1997	2
Garfield Medical Center	Monterey Park, CA	1997–1998	2
El Camino Hospital	Mountain View, CA	1993–1994	2
Hoag Memorial Hospital Presbyterian	Newport Beach, CA	1993–1994	2
UCI Medical Center	Orange, CA	2003–2004	2
Sutter Medical Center, Sacramento	Sacramento, CA	2001–2002	2
Mercy General Hospital	Sacramento, CA	1997, 2006	2
Scripps Mercy Hospital	San Diego, CA	2000–2001	2
Inland Valley Medical Center	Wildomar, CA	1994, 2001	2
Penrose–St. Francis Health Services	Colorado Springs, CO	1998, 2003	2
Porter Adventist Hospital	Denver, CO	2001, 2003	2
St. Anthony Central Hospital	Denver, CO	1998, 2001	2
Swedish Medical Center	Englewood, CO	2002–2003	2
Hospital of St. Raphael	New Haven, CT	1998–1999	2
Cape Coral Hospital	Cape Coral, FL	2000, 2002	2
Seven Rivers Regional Medical Center	Crystal River, FL	1999, 2001	2
Pasco Regional Medical Center	Dade City, FL	1997, 2003	2
Gulf Coast Hospital	Fort Myers, FL	1996–1997	2
Citrus Memorial Hospital	Inverness, FL	1993, 1998	2
Baptist Medical Center	Jacksonville, FL	1996–1997	2
University of Miami Hospital	Miami, FL	1997–1998	2
Jackson North Medical Center	North Miami Beach, FL	1994, 1998	2
Munroe Regional Medical Center	Ocala, FL	1999, 2003	2
Florida Hospital–Flagler	Palm Coast, FL	2004–2005	2
Gulf Coast Medical Center	Panama City, FL	1995, 1999	2
Memorial Hospital West	Pembroke Pines, FL	2008–2009	2
South Miami Hospital	South Miami, FL	1999, 2002	2
Bayfront Medical Center	St. Petersburg, FL	1998, 2001	2

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University Hospital and Medical Center	Tamarac, FL	1995–1996	2
Piedmont Hospital	Atlanta, GA	2001, 2004	2
Saint Joseph's Hospital of Atlanta	Atlanta, GA	1993, 2005	2
MCG Health System	Augusta, GA	2002, 2007	2
Union General Hospital	Blairsville, GA	1994, 2007	2
Hamilton Medical Center	Dalton, GA	1995–1996	2
Donalsonville Hospital	Donalsonville, GA	1999, 2001	2
Tanner Medical Center–Villa Rica	Villa Rica, GA	1996, 2001	2
St. Mary's Hospital & Clinics	Cottonwood, ID	1995, 2000	2
St. Benedict's Family Medical Center	Jerome, ID	1998–1999	2
Northwest Community Hospital	Arlington Heights, IL	2001, 2006	2
MacNeal Hospital	Berwyn, IL	1993, 1996	2
University of Chicago Medical Center	Chicago, IL	1995, 2005	2
Greenville Regional Hospital	Greenville, IL	2002, 2004	2
Morris Hospital and Healthcare Centers	Morris, IL	1993, 2006	2
Deaconess Hospital & Health System	Evansville, IN	1995–1996	2
St. Francis Hospital-Indianapolis	Indianapolis, IN	2008–2009	2
Memorial Hospital and Health Care Center	Jasper, IN	2004, 2008	2
The King's Daughters' Hospital & Health Services	Madison, IN	2007–2008	2
Major Hospital	Shelbyville, IN	2008–2009	2
The Finley Hospital	Dubuque, IA	1993, 2009	2
Fort Madison Community Hospital	Fort Madison, IA	2001, 2004	2
St. Francis Health Center	Topeka, KS	1994, 1996	2
Hardin Memorial Hospital	Elizabethtown, KY	2006–2007	2
Harlan ARH Hospital	Harlan, KY	1998, 2007	2
Trover Health System	Madisonville, KY	2002, 2009	2
Manchester Memorial Hospital	Manchester, KY	2000–2001	2
Wayne County Hospital	Monticello, KY	1995–1996	2
Bourbon Community Hospital	Paris, KY	1997–1998	2
Minden Medical Center	Minden, LA	2003, 2009	2
The Johns Hopkins Hospital	Baltimore, MD	1993–1994	2
Union Memorial Hospital	Baltimore, MD	2003, 2008	2
Union Hospital	Elkton, MD	2001, 2004	2
Northwest Hospital Center	Randallstown, MD	2001–2002	2
MetroWest Medical Center	Natick, MA	1995–1996	2
St. Luke's Hospital	New Bedford, MA	1995–1996	2
Gratiot Medical Center	Alma, MI	2006, 2008	2
Mecosta County Medical Center	Big Rapids, MI	2005–2006	2
Chelsea Community Hospital	Chelsea, MI	1993, 2009	2
McLaren Regional Medical Center	Flint, MI	2000, 2006	2
Bronson Methodist Hospital	Kalamazoo, MI	2005, 2009	2
Central Michigan Community Hospital	Mount Pleasant, MI	1993, 2008	2
Hackley Hospital	Muskegon, MI	2006–2007	2
Douglas County Hospital	Alexandria, MN	2001, 2008	2
Park Nicollet Methodist Hospital	St. Louis Park, MN	2000, 2004	2

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
United Hospital	St. Paul, MN	1994–1995	2
Fairview Southdale Hospital	Edina, MN	1993, 1997	2
Boone Hospital Center	Columbia, MO	2004, 2009	2
Parkland Health Center–Farmington	Farmington, MO	2007–2008	2
St. John's Regional Medical Center	Joplin, MO	2006, 2008	2
Northeast Regional Medical Center	Kirkville, MO	2007, 2009	2
SSM St. Joseph Hospital West	Lake Saint Louis, MO	2000, 2003	2
Cox Health	Springfield, MO	1996–1997	2
Missouri Baptist Medical Center	St. Louis, MO	2008–2009	2
St. Peter's Hospital	Albany, NY	1998, 2001	2
Parkland Medical Center	Derry, NH	1995, 2001	2
Gaston Memorial Hospital	Gastonia, NC	2001, 2009	2
Franklin Regional Medical Center	Louisburg, NC	1995–1996	2
Jamestown Hospital	Jamestown, ND	1993, 2008	2
Mercy Medical Center	Canton, OH	2001–2002	2
University Hospitals Geauga Regional Hospital	Chardon, OH	1998, 2001	2
Adena Regional Medical Center	Chillicothe, OH	2003, 2005	2
Good Samaritan Hospital	Cincinnati, OH	2007–2008	2
Good Samaritan Hospital	Dayton, OH	2000–2001	2
Atrium Medical Center	Franklin, OH	1998–1999	2
Brown County General Hospital	Georgetown, OH	2001–2002	2
St. Rita's Medical Center	Lima, OH	1996, 1999	2
Dunlap Memorial Hospital	Orrville, OH	2002–2003	2
Lake Hospital System	Painesville, OH	2002, 2005	2
Mercy Health Center	Oklahoma City, OK	1993–1994	2
Sacred Heart Medical Center	Eugene, OR	1993–1994	2
Grande Ronde Hospital	La Grande, OR	1993–1994	2
Samaritan Lebanon Community Hospital	Lebanon, OR	1993–1994	2
St. Luke's Hospital and Health Network	Bethlehem, PA	1997, 2001	2
Butler Memorial Hospital	Butler, PA	2003–2004	2
Excela Health Westmoreland	Greensburg, PA	2000–2001	2
St. Mary Medical Center	Langhorne, PA	2002–2003	2
Excela Health Latrobe Area Hospital	Latrobe, PA	1997, 2002	2
Paoli Hospital	Paoli, PA	2003–2004	2
UPMC St. Margaret	Pittsburgh, PA	2003–2004	2
UPMC Passavant	Pittsburgh, PA	2000–2001	2
Punxsutawney Area Hospital	Punxsutawney, PA	1998–1999	2
St. Joseph Medical Center	Reading, PA	2001–2002	2
The Reading Hospital and Medical Center	West Reading, PA	1998, 2001	2
Trident Health System	Charleston, SC	1998–1999	2
Medical University of South Carolina	Charleston, SC	1996–1997	2
Prairie Lakes Healthcare System	Watertown, SD	2004–2005	2
Parkridge Medical Center	Chattanooga, TN	2001, 2003	2
Cookeville Regional Medical Center	Cookeville, TN	2006–2007	2
St. Mary's Jefferson Memorial Hospital	Jefferson City, TN	2008–2009	2

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
St. Mary's Medical Center of Campbell County	LaFollette, TN	2007–2008	2
Seton Medical Center Austin	Austin, TX	1994, 2003	2
Central Texas Hospital	Cameron, TX	2005–2006	2
Memorial Hermann Hospital System	Houston, TX	1996, 1999	2
Memorial Hermann–Texas Medical Center	Houston, TX	1995–1996	2
East Houston Regional Medical Center	Houston, TX	1995, 2003	2
Harris County Hospital District	Houston, TX	1994–1995	2
Llano Memorial Healthcare System	Llano, TX	1994–1995	2
Trinity Mother Frances Hospital	Tyler, TX	2006, 2009	2
Lakeview Hospital	Bountiful, UT	1996, 2001	2
Logan Regional Hospital	Logan, UT	2000–2001	2
San Juan Hospital	Monticello, UT	2003–2004	2
Mountain View Hospital	Payson, UT	1995, 1997	2
Augusta Medical Center	Fishersville, VA	1997–1998	2
Memorial Regional Medical Center	Mechanicsville, VA	2008–2009	2
Sentara Leigh Hospital	Norfolk, VA	2001–2002	2
VCU Medical Center	Richmond, VA	1997, 2002	2
Sentara Virginia Beach General Hospital	Virginia Beach, VA	2000–2001	2
Whitman Hospital & Medical Center	Colfax, WA	1994–1995	2
Valley Medical Center	Renton, WA	2003–2004	2
Sunnyside Community Hospital	Sunnyside, WA	1994, 1998	2
St. Mary Medical Center	Walla Walla, WA	1993, 2006	2
St. Elizabeth Hospital	Appleton, WI	2001, 2004	2
Baldwin Area Medical Center	Baldwin, WI	1995–1996	2
St. Mary's Hospital	Madison, WI	1994, 2006	2
Bay Area Medical Center	Marinette, WI	2004, 2006	2
The Monroe Clinic	Monroe, WI	2006, 2008	2
Waukesha Memorial Hospital	Waukesha, WI	1995, 2008	2
Aurora West Allis Medical Center	West Allis, WI	2007–2008	2
Powell Valley Healthcare	Powell, WY	1997, 1999	2
UAB Hospital	Birmingham, AL	1996	1
J. Paul Jones Hospital	Camden, AL	2003	1
Lake Martin Community Hospital	Dadeville, AL	2001	1
Medical Center Enterprise	Enterprise, AL	2000	1
Lakeview Community Hospital	Eufaula, AL	1993	1
Evergreen Medical Center	Evergreen, AL	2009	1
Riverview Regional Medical Center	Gadsden, AL	1997	1
Baptist Medical Center East	Montgomery, AL	2009	1
Russellville Hospital	Russellville, AL	1998	1
Southwest Alabama Medical Center	Thomasville, AL	2000	1
Lanier Health Services	Valley, AL	1998	1
Wedowee Hospital	Wedowee, AL	1999	1
Hill Hospital of Sumter County	York, AL	2001	1
Arrowhead Hospital	Glendale, AZ	2006	1
Mesa General Hospital	Mesa, AZ	1997	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
La Paz Regional Hospital	Parker, AZ	2007	1
Community Hospital Medical Center	Phoenix, AZ	1995	1
John C. Lincoln–North Mountain	Phoenix, AZ	2003	1
Mayo Clinic Hospital	Phoenix, AZ	2003	1
Yavapai Regional Medical Center	Prescott, AZ	2005	1
Sun Health Boswell Hospital	Sun City, AZ	2003	1
Tempe St Luke's Hospital	Tempe, AZ	2000	1
Booneville Community Hospital	Booneville, AR	2001	1
West Anaheim Medical Center	Anaheim, CA	2008	1
Methodist Hospital of Southern California	Arcadia, CA	1993	1
Providence Saint Joseph Medical Center	Burbank, CA	1998	1
Sutter Davis Hospital	Davis, CA	2007	1
Mercy Hospital of Folsom	Folsom, CA	2003	1
Fountain Valley Regional Hospital and Medical Center	Fountain Valley, CA	1996	1
Saint Agnes Medical Center	Fresno, CA	1996	1
Sierra Nevada Memorial Hospital	Grass Valley, CA	2004	1
Hemet Valley Medical Center	Hemet, CA	1999	1
Saddleback Memorial Medical Center	Laguna Hills, CA	2009	1
Lakewood Regional Medical Center	Lakewood, CA	1993	1
Lancaster Community Hospital	Lancaster, CA	1996	1
Pacific Alliance Medical Center	Los Angeles, CA	2007	1
CHA Hollywood Presbyterian Medical Center	Los Angeles, CA	1996	1
Montclair Hospital Medical Center	Montclair, CA	2009	1
Plumas District Hospital	Quincy, CA	1997	1
Eisenhower Medical Center	Rancho Mirage, CA	2004	1
Sierra Kings District Hospital	Reedley, CA	1994	1
Parkview Community Hospital Medical Center	Riverside, CA	1993	1
UC Davis Medical Center	Sacramento, CA	1994	1
UC San Diego Medical Center - Hillcrest	San Diego, CA	2009	1
Good Samaritan Medical Center	San Jose, CA	1995	1
O'Connor Hospital	San Jose, CA	1994	1
Santa Ana Hospital Medical Center	Santa Ana, CA	2001	1
Sonora Regional Medical Center	Sonora, CA	1998	1
Stanford Hospital & Clinics	Stanford, CA	1994	1
Little Company of Mary Hospital	Torrance, CA	1993	1
San Antonio Community Hospital	Upland, CA	2008	1
Citrus Valley Medical Center– Queen of the Valley Campus	West Covina, CA	1993	1
Fairchild Medical Center	Yreka, CA	2004	1
San Luis Valley Regional Medical Center	Alamosa, CO	1994	1
The Medical Center of Aurora	Aurora, CO	2003	1
University of Colorado Hospital	Aurora, CO	1996	1
Denver Health Medical Center	Denver, CO	2005	1
Presbyterian/St Luke's Medical Center	Denver, CO	2001	1
Valley View Hospital	Glenwood Springs, CO	2004	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
Community Hospital	Grand Junction, CO	2001	1
North Colorado Medical Center	Greeley, CO	2001	1
Avista Adventist Hospital	Louisville, CO	2001	1
Montrose Memorial Hospital	Montrose, CO	1993	1
University of Connecticut Health Center	Farmington, CT	2006	1
Christiana Care Health System	Wilmington, DE	2000	1
Washington Hospital Center	Washington, DC	1999	1
Boca Raton Community Hospital	Boca Raton, FL	1998	1
Bethesda Memorial Hospital	Boynton Beach, FL	1994	1
Manatee Memorial Hospital	Bradenton, FL	2003	1
Oak Hill Hospital	Brooksville, FL	2001	1
North Okaloosa Medical Center	Crestview, FL	2001	1
Halifax Health Medical Center	Daytona Beach, FL	2002	1
Englewood Community Hospital	Englewood, FL	2001	1
Baptist Medical Center Nassau	Fernandina Beach, FL	2001	1
Florida Medical Center	Fort Lauderdale, FL	2000	1
St. Luke's Hospital	Jacksonville, FL	2007	1
Northwest Medical Center	Margate, FL	1996	1
Sacred Heart Hospital on the Emerald Coast	Miramar Beach, FL	2008	1
Memorial Hospital Miramar	Miramar, FL	2009	1
Ocala Regional Medical Center	Ocala, FL	2001	1
Florida Hospital–Ormond Memorial	Ormond Beach, FL	2003	1
Putnam Community Medical Center	Palatka, FL	1998	1
Bay Medical Center	Panama City, FL	2004	1
West Florida Hospital	Pensacola, FL	1995	1
Doctor's Memorial Hospital	Perry, FL	1997	1
Columbia Pompano Beach Medical Center	Pompano Beach, FL	1995	1
Palms of Pasadena Hospital	Saint Petersburg, FL	2000	1
Sarasota Memorial Hospital	Sarasota, FL	2003	1
Sebastian River Medical Center	Sebastian, FL	2005	1
St. Joseph's Hospital	Tampa, FL	2007	1
Memorial Regional Hospital South	Tampa, FL	1995	1
The Villages Regional Hospital	The Villages, FL	2006	1
Venice Regional Medical Center	Venice, FL	2009	1
Emory University Hospital	Atlanta, GA	1994	1
Doctors Hospital	Augusta, GA	2000	1
Wellstar Cobb Hospital	Austell, GA	1994	1
Fannin Regional Hospital	Blue Ridge, GA	2002	1
Grady General Hospital	Cairo, GA	2001	1
South Fulton Medical Center	East Point, GA	1993	1
Northeast Georgia Medical Center	Gainesville, GA	2009	1
Coliseum Medical Centers	Macon, GA	1995	1
Medical Center of Central Georgia	Macon, GA	1993	1
Flint River Community Hospital	Montezuma, GA	1996	1
St. Joseph's/Candler Hospital	Savannah, GA	1996	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
East Georgia Regional Medical Center	Statesboro, GA	1999	1
Wilcox Memorial Hospital	Lihue, HI	1999	1
Eastern Idaho Regional Medical Center	Idaho Falls, ID	2001	1
Gritman Medical Center	Moscow, ID	1994	1
Madison Memorial Hospital	Rexburg, ID	1993	1
Twin Falls Clinic & Hospital	Twin Falls, ID	1997	1
Rush–Copley Medical Center	Aurora, IL	2006	1
MetroSouth Medical Center	Blue Island, IL	2001	1
Rush University Medical Center	Chicago, IL	2009	1
Advocate Illinois Masonic Medical Center	Chicago, IL	2009	1
Michael Reese Hospital and Medical Center	Chicago, IL	1995	1
Advocate Good Samaritan Hospital	Downers Grove, IL	2008	1
FHN Memorial Hospital	Freeport, IL	2007	1
Hillsboro Area Hospital	Hillsboro, IL	1998	1
St. Alexius Medical Center	Hoffman Estates, IL	1999	1
Heartland Regional Medical Center	Marion, IL	2001	1
Sarah Bush Lincoln Health Center	Mattoon, IL	2005	1
Ottawa Regional Hospital & Healthcare Center	Ottawa, IL	1994	1
Trinity Regional Health System–West Campus	Rock Island, IL	2006	1
SwedishAmerican Hospital	Rockford, IL	1999	1
Iroquois Memorial Hospital	Watseka, IL	2004	1
Vista Medical Center East	Waukegan, IL	1993	1
Community Hospital Anderson	Anderson, IN	1993	1
DeKalb Memorial Hospital	Auburn, IN	2006	1
Margaret Mary Community Hospital	Batesville, IN	2004	1
St. Francis Hospital–Beech Grove	Beech Grove, IN	2004	1
St. Vincent Carmel Hospital	Carmel, IN	2009	1
Columbus Regional Hospital	Columbus, IN	2008	1
Lutheran Hospital of Indiana	Fort Wayne, IN	2001	1
Parkview Hospital	Fort Wayne, IN	1996	1
Parkview Huntington Hospital	Huntington, IN	2009	1
Community Hospital East/North	Indianapolis, IN	2001	1
Westview Hospital	Indianapolis, IN	1996	1
Clarian Health/Indiana University Medical Center	Indianapolis, IN	1993	1
Ball Memorial Hospital	Muncie, IN	2000	1
Community Hospital	Munster, IN	2009	1
Floyd Memorial Hospital and Health Services	New Albany, IN	1993	1
Scott Memorial Hospital	Scottsburg, IN	2002	1
Saint Joseph Regional Medical Center–South Bend	South Bend, IN	2008	1
Memorial Hospital of South Bend	South Bend, IN	2005	1
Terre Haute Regional Hospital	Terre Haute, IN	2000	1
Sartori Memorial Hospital	Cedar Falls, IA	2003	1
Greater Regional Medical Center	Creston, IA	1993	1
Winneshiek Medical Center	Decorah, IA	2004	1
Mercy Medical Center–Dubuque	Dubuque, IA	2008	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
Floyd Valley Hospital	Le Mars, IA	2004	1
Henry County Health Center	Mount Pleasant, IA	1994	1
Burgess Health Center	Onawa, IA	1995	1
Allen Hospital	Waterloo, IA	2004	1
Goodland Regional Medical Center	Goodland, KS	1996	1
Osborne County Memorial Hospital	Osborne, KS	1995	1
St. John's Hospital	Salina, KS	1993	1
Scott County Hospital	Scott City, KS	1997	1
Frankfort Regional Medical Center	Frankfort, KY	2001	1
Breckinridge Memorial Hospital	Hardinsburg, KY	1996	1
Saint Joseph–London	London, KY	2008	1
Saint Joseph–Martin	Martin, KY	1999	1
Jackson Purchase Medical Center	Mayfield, KY	2009	1
McDowell ARH Hospital	McDowell, KY	2003	1
Lake Cumberland Regional Hospital	Somerset, KY	1997	1
Clark Regional Medical Center	Winchester, KY	2001	1
Rapides Regional Medical Center	Alexandria, LA	1997	1
Baton Rouge General	Baton Rouge, LA	1994	1
West Jefferson Medical Center	Marrero, LA	1996	1
Ochsner Medical Center	New Orleans, LA	2009	1
Oakdale Community Hospital	Oakdale, LA	1998	1
Willis–Knighton Medical Center	Shreveport, LA	2005	1
Willis–Knighton Medical Center South	Shreveport, LA	1994	1
Maine Medical Center	Portland, ME	2001	1
Anne Arundel Medical Center	Annapolis, MD	2004	1
Franklin Square Hospital Center	Baltimore, MD	2003	1
Mercy Medical Center	Baltimore, MD	1996	1
St. Agnes Hospital	Baltimore, MD	1995	1
Greater Baltimore Medical Center	Baltimore, MD	1993	1
Baltimore Washington Medical Center	Glen Burnie, MD	2006	1
Sturdy Memorial Hospital	Attleboro, MA	2001	1
Massachusetts General Hospital	Boston, MA	2001	1
Boston Medical Center	Boston, MA	2003	1
NSMC Salem Hospital	Salem, MA	2001	1
South Shore Hospital	South Weymouth, MA	2005	1
Hubbard Regional Hospital	Webster, MA	2000	1
Winchester Hospital	Winchester, MA	1997	1
Saint Vincent Hospital	Worcester, MA	2000	1
Bay Regional Medical Center	Bay City, MI	2004	1
Mercy Hospital Cadillac	Cadillac, MI	2008	1
MidMichigan Medical Center–Clare	Clare, MI	2007	1
Garden City Hospital	Garden City, MI	2007	1
Genesys Regional Medical Center	Grand Blanc, MI	2005	1
Pennock Hospital	Hastings, MI	2006	1
St. Joseph Mercy Livingston Hospital	Howell, MI	2009	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
Grand View Hospital	Ironwood, MI	2005	1
Sparrow Health System	Lansing, MI	1999	1
Oaklawn Hospital	Marshall, MI	1994	1
Mercy Health Partners	Muskegon, MI	2006	1
Port Huron Hospital	Port Huron, MI	2006	1
St. Joseph Mercy Port Huron	Port Huron, MI	1993	1
St. Joseph Hospital	Tawas City, MI	2009	1
Zeeland Community Hospital	Zeeland, MI	1993	1
Austin Medical Center	Austin, MN	2000	1
Clearwater County Memorial Hospital	Bagley, MN	1998	1
Swift County–Benson Hospital	Benson, MN	2002	1
Cambridge Medical Center	Cambridge, MN	1993	1
Mercy Hospital	Coon Rapids, MN	1994	1
District One Hospital	Faribault, MN	1993	1
Grand Itasca Clinic & Hospital	Grand Rapids, MN	2000	1
University of Minnesota Medical Center–Fairview	Minneapolis, MN	1993	1
Abbott Northwestern Hospital	Minneapolis, MN	1993	1
Northfield Hospital	Northfield, MN	1999	1
Perham Memorial Hospital and Home	Perham, MN	2003	1
Olmsted Medical Center	Rochester, MN	2001	1
St. Francis Regional Medical Center	Shakopee, MN	2004	1
St. Joseph's Hospital	St. Paul, MN	2004	1
Woodwinds Health Campus	Woodbury, MN	2009	1
Fairview Lakes Medical Center	Wyoming, MN	1995	1
Missouri Southern Healthcare	Dexter, MO	2005	1
Freeman Health System	Joplin, MO	2002	1
St. John's St. Francis Hospital	Mountain View, MO	2001	1
Ray County Memorial Hospital	Richmond, MO	2005	1
SSM St. Mary's Health Center	St. Louis, MO	2006	1
Barnes-Jewish St. Peters Hospital	St. Peters, MO	2009	1
The University of Mississippi Medical Center	Jackson, MS	2007	1
North Mississippi Medical Center	Tupelo, MS	2008	1
Community Hospital of Anaconda	Anaconda, MT	1997	1
Billings Clinic	Billings, MT	2002	1
Marcus Daly Memorial Hospital	Hamilton, MT	1994	1
BryanLGH Medical Center	Lincoln, NE	2003	1
Niobrara Valley Hospital	Lynch, NE	1995	1
Creighton University Medical Center	Omaha, NE	2001	1
University Medical Center	Las Vegas, NV	1997	1
Dartmouth–Hitchcock Medical Center	Lebanon, NH	2001	1
Catholic Medical Center	Manchester, NH	1993	1
Kennedy Memorial Hospital	Cherry Hill, NJ	2000	1
Robert Wood Johnson University Hospital	New Brunswick, NJ	2006	1
Lea Regional Medical Center	Hobbs, NM	2001	1
Presbyterian Hospital	Albuquerque, NM	1993	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
University of New Mexico Hospital	Albuquerque, NM	1993	1
Nor–Lea Hospital District	Lovington, NM	2002	1
Lincoln County Medical Center	Ruidoso, NM	1994	1
North Shore University Hospital	Manhasset, NY	2001	1
Stony Brook University Hospital	Stony Brook, NY	1996	1
St. Joseph's Hospital Health Center	Syracuse, NY	2001	1
Duke University Hospital	Durham, NC	2008	1
Morehead Memorial Hospital	Eden, NC	1993	1
Pitt County Memorial Hospital	Greenville, NC	2002	1
Rex Healthcare	Raleigh, NC	2007	1
Rutherford Hospital, Inc.	Rutherfordton, NC	2008	1
Wake Forest University Baptist Medical Center	Winston–Salem, NC	2003	1
MeritCare Medical Center	Fargo, ND	2003	1
Union Hospital	Mayville, ND	1996	1
Community Hospitals and Wellness Centers	Bryan, OH	2006	1
Jewish Hospital	Cincinnati, OH	2005	1
MetroHealth Medical Center	Cleveland, OH	2007	1
Doctors Hospital	Columbus, OH	2009	1
Mount Carmel West	Columbus, OH	2002	1
Miami Valley Hospital	Dayton, OH	1997	1
Union Hospital	Dover, OH	2008	1
Mercy Hospital Fairfield	Fairfield, OH	2005	1
Blanchard Valley Regional Health Center– Findlay Campus	Findlay, OH	2005	1
Community Memorial Hospital	Hicksville, OH	1994	1
Lima Memorial Hospital	Lima, OH	2006	1
Memorial Hospital of Union County	Marysville, OH	2002	1
Knox Community Hospital	Mount Vernon, OH	1996	1
Henry County Hospital	Napoleon, OH	2001	1
Parma Community General Hospital	Parma, OH	2002	1
Van Wert County Hospital	Warren, OH	2000	1
Forum Health Trumbull Memorial Hospital	Warren, OH	2004	1
St. Joseph Health Center	Warren, OH	2000	1
St. Elizabeth Boardman Health Center	Youngstown, OH	2009	1
OU Medical Center	Oklahoma City, OK	1997	1
Perry Memorial Hospital	Perry, OK	1994	1
Sequoyah Memorial Hospital	Sallisaw, OK	2002	1
Memorial Hospital	Stilwell, OK	2007	1
Saint Francis Hospital	Tulsa, OK	1993	1
INTEGRIS Canadian Valley Regional Hospital	Yukon, OK	2005	1
Good Samaritan Regional Medical Center	Corvallis, OR	1993	1
Three Rivers Hospital–Dimmick	Grants Pass, OR	1993	1
Rogue Valley Medical Center	Medford, OR	1994	1
Providence Newberg Medical Center	Newberg, OR	2003	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
Willamette Falls Hospital	Oregon City, OR	1993	1
Oregon Health & Science University	Portland, OR	2001	1
Legacy Good Samaritan Hospital and Medical Center	Portland, OR	1993	1
Adventist Medical Center	Portland, OR	1993	1
Salem Hospital	Salem, OR	1994	1
Silverton Hospital	Silverton, OR	2005	1
Legacy Meridian Park Hospital	Tualatin, OR	1994	1
Bryn Mawr Hospital	Bryn Mawr, PA	2008	1
UPMC Horizon	Greenville, PA	1993	1
Lewistown Hospital	Lewistown, PA	2001	1
Hospital of the University of Pennsylvania	Philadelphia, PA	1995	1
UPMC Presbyterian	Pittsburgh, PA	2003	1
St. Clair Hospital	Pittsburgh, PA	2001	1
Titusville Area Hospital	Titusville, PA	2000	1
Tyrone Hospital	Tyrone, PA	2001	1
Southwest Regional Medical Center	Waynesburg, PA	2002	1
Geisinger Wyoming Valley Medical Center	Wilkes-Barre, PA	2004	1
Rhode Island Hospital	Providence, RI	1997	1
Roger Williams Medical Center	Providence, RI	1998	1
Kent Hospital	Warwick, RI	2001	1
Colleton Medical Center	Walterboro, SC	1997	1
Avera St. Benedict Health Center	Parkston, SD	1995	1
Spearfish Regional Hospital	Spearfish, SD	1996	1
Cumberland River Hospital	Celina, TN	1997	1
SkyRidge Medical Center	Cleveland, TN	1993	1
Cumberland Medical Center	Crossville, TN	1998	1
Rhea Medical Center	Dayton, TN	2002	1
Horizon Medical Center	Dickson, TN	1995	1
Woods Memorial Hospital District	Etowah, TN	1996	1
Summit Medical Center	Hermitage, TN	1997	1
Grandview Medical Center	Jasper, TN	1997	1
Jellico Community Hospital	Jellico, TN	2004	1
Wellmont Holston Valley Medical Center	Kingsport, TN	1999	1
Indian Path Medical Center	Kingsport, TN	1999	1
St. Mary's Medical Center	Knoxville, TN	2006	1
The University of Tennessee Medical Center	Knoxville, TN	1999	1
Crockett Hospital	Lawrenceburg, TN	2002	1
Marshall Medical Center	Lewisburg, TN	2002	1
River Park Hospital	McMinnville, TN	1995	1
Methodist University Hospital	Memphis, TN	1997	1
Skyline Medical Center	Nashville, TN	2009	1
Erlanger Bledsoe Hospital	Pikeville, TN	2001	1
Fort Sanders Sevier Medical Center	Sevierville, TN	2007	1
StoneCrest Medical Center	Smyrna, TN	2009	1
White County Community Hospital	Sparta, TN	2006	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
St. David's Medical Center	Austin, TX	2009	1
St. David's South Austin Hospital	Austin, TX	2001	1
Childress Regional Medical Center	Childress, TX	2005	1
Corpus Christi Medical Center	Corpus Christi, TX	2001	1
Presbyterian Hospital of Dallas	Dallas, TX	1996	1
Medical City Dallas Hospital	Dallas, TX	1995	1
Tri-City Health Centre	Dallas, TX	1995	1
Ennis Regional Medical Center	Ennis, TX	2006	1
Connally Memorial Medical Center	Floresville, TX	2009	1
Hill Country Memorial Hospital	Fredericksburg, TX	2003	1
Memorial Hermann Memorial City Medical Center	Houston, TX	2009	1
The Methodist Hospital	Houston, TX	2003	1
Spring Branch Medical Center	Houston, TX	1999	1
Baylor Medical Center at Irving	Irving, TX	1993	1
Christus Jasper Memorial Hospital	Jasper, TX	1997	1
South Texas Regional Medical Center	Jourdanton, TX	1999	1
Memorial Hermann Katy Hospital	Katy, TX	2009	1
Brazosport Regional Health System	Lake Jackson, TX	2007	1
Laredo Medical Center	Laredo, TX	1997	1
Good Shepherd Medical Center	Longview, TX	1999	1
Mesquite Community Hospital	Mesquite, TX	1995	1
Parkview Regional Hospital	Mexia, TX	1996	1
Bayshore Medical Center	Pasadena, TX	1997	1
Medical Center of Plano	Plano, TX	1998	1
East Texas Medical Center Quitman	Quitman, TX	1996	1
Baptist Health System	San Antonio, TX	2005	1
Methodist Hospital	San Antonio, TX	2003	1
Providence Health Center	Waco, TX	2005	1
McKay-Dee Hospital Center	Ogden, UT	2009	1
Ogden Regional Medical Center	Ogden, UT	2001	1
LDS Hospital	Salt Lake City, UT	1993	1
Dixie Regional Medical Center	St. George, UT	2009	1
Ashley Valley Medical Center	Vernal, UT	2002	1
Martha Jefferson Hospital	Charlottesville, VA	2000	1
Culpeper Regional Hospital	Culpeper, VA	1995	1
INOVA Fair Oaks Hospital	Fairfax, VA	1999	1
INOVA Loudoun Hospital	Leesburg, VA	1993	1
Lee Regional Medical Center	Pennington Gap, VA	1996	1
Henrico Doctors' Hospital	Richmond, VA	2003	1
CJW Medical Center	Richmond, VA	1999	1
Potomac Hospital	Woodbridge, VA	1994	1
Cascade Valley Hospital and Clinics	Arlington, WA	1994	1
St. Joseph Hospital	Bellingham, WA	2005	1
Harrison Medical Center	Bremerton, WA	1996	1
Mount Carmel Hospital	Colville, WA	1994	1

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HOSPITAL	LOCATION	YEAR(S) WON	TOTAL YEAR(S) WON
Enumclaw Regional Hospital	Enumclaw, WA	2000	1
St. John Medical Center	Longview, WA	1993	1
Samaritan Hospital	Moses Lake, WA	1994	1
Othello Community Hospital	Othello, WA	1995	1
Virginia Mason Medical Center	Seattle, WA	2002	1
Northwest Hospital & Medical Center	Seattle, WA	1994	1
University of Washington Medical Center	Seattle, WA	1993	1
Sacred Heart Medical Center	Spokane, WA	1994	1
Deaconess Medical Center	Spokane, WA	1993	1
Allenmore Hospital	Tacoma, WA	1998	1
Toppenish Community Hospital	Toppenish, WA	2006	1
United Hospital Center	Clarksburg, WV	2007	1
St. Joseph's Hospital	Parkersburg, WV	2000	1
Greenbrier Valley Medical Center	Ronceverte, WV	2007	1
Williamson Memorial Hospital	Williamson, WV	2001	1
Memorial Medical Center	Ashland, WI	1993	1
Beaver Dam Community Hospitals, Inc.	Beaver Dam, WI	1997	1
St. Joseph's Hospital	Chippewa Falls, WI	2007	1
Memorial Hospital of Lafayette County	Darlington, WI	1995	1
Aurora BayCare Medical Center	Green Bay, WI	2009	1
St. Mary's Hospital Medical Center	Green Bay, WI	2003	1
St. Vincent Hospital	Green Bay, WI	1994	1
Mercy Hospital Janesville	Janesville, WI	1993	1
Grant Regional Health Center	Lancaster, WI	1994	1
Meriter Hospital	Madison, WI	2009	1
Community Memorial Hospital	Menomonee Falls, WI	1993	1
Red Cedar Medical Center	Menomonie, WI	1994	1
Wheaton Franciscan Healthcare—St. Joseph	Milwaukee, WI	2008	1
Columbia St. Mary's Hospital Milwaukee	Milwaukee, WI	2006	1
Columbia St. Mary's Hospital Columbia	Milwaukee, WI	2005	1
Aurora St. Luke's Medical Center	Milwaukee, WI	1993	1
Mercy Medical Center	Oshkosh, WI	2004	1
Riverside Medical Center	Waupaca, WI	2004	1
Waupun Memorial Hospital	Waupun, WI	1996	1
Aspirus Wausau Hospital	Wausau, WI	1994	1
Howard Young Medical Center	Woodruff, WI	1993	1
Ivinson Memorial Hospital	Laramie, WY	1993	1
Riverton Memorial Hospital	Riverton, WY	1995	1

* Hospitals are organized by total years won, then by state, city, and hospital name.

APPENDIX A

Distribution of 100 Top Hospitals: National Benchmark Winners by State and Region*

STATE	NUMBER OF CURRENT BENCHMARK HOSPITALS	NUMBER OF PREVIOUS YEAR BENCHMARK HOSPITALS	STATE	NUMBER OF CURRENT BENCHMARK HOSPITALS	NUMBER OF PREVIOUS YEAR BENCHMARK HOSPITALS
Alabama	2	0	Montana	0	0
Alaska	0	0	Nebraska	1	2
Arizona	3	2	Nevada	0	0
Arkansas	0	1	New Hampshire	0	0
California	6	4	New Jersey	0	0
Colorado	1	1	New Mexico	0	0
Connecticut	0	1	New York	0	0
Delaware	0	0	North Carolina	1	2
District of Columbia	0	0	North Dakota	0	1
Florida	5	3	Ohio	8	10
Georgia	2	1	Oklahoma	0	1
Hawaii	0	0	Oregon	0	1
Idaho	1	1	Pennsylvania	4	5
Illinois	8	7	Rhode Island	0	0
Indiana	6	8	South Carolina	0	0
Iowa	2	2	South Dakota	2	1
Kansas	0	0	Tennessee	8	6
Kentucky	3	5	Texas	8	4
Louisiana	2	0	Utah	3	1
Maine	0	0	Vermont	0	0
Maryland	0	1	Virginia	1	2
Massachusetts	0	1	Washington	0	1
Michigan	11	11	West Virginia	0	0
Minnesota	4	4	Wisconsin	4	6
Mississippi	0	1	Wyoming	0	0
Missouri	4	3			

REGION*	NUMBER OF CURRENT BENCHMARK HOSPITALS	NUMBER OF PREVIOUS YEAR BENCHMARK HOSPITALS
Northeast	4	7
Midwest	50	55
South	32	27
West	14	11

* For a listing of states within each census region, see Appendix B.

APPENDIX B

States Included in Each Census Region

NORTHEAST	MIDWEST	SOUTH	WEST
Connecticut	Illinois	Alabama	Alaska
Maine	Indiana	Arkansas	Arizona
Massachusetts	Iowa	Delaware	California
New Hampshire	Kansas	District of Columbia	Colorado
New Jersey	Michigan	Florida	Hawaii
New York	Minnesota	Georgia	Idaho
Pennsylvania	Missouri	Kentucky	Montana
Rhode Island	Nebraska	Louisiana	Nevada
Vermont	North Dakota	Maryland	New Mexico
	Ohio	Mississippi	Oregon
	South Dakota	North Carolina	Utah
	Wisconsin	Oklahoma	Washington
		South Carolina	Wyoming
		Tennessee	
		Texas	
		Virginia	
		West Virginia	

APPENDIX C

Methodology Details

METHODS FOR IDENTIFYING COMPLICATIONS OF CARE

Risk-Adjusted Mortality Index Models

Without adjusting for differences, comparing outcomes among hospitals is like comparing the proverbial apples to oranges: hard, if not impossible, to do. In order to make valid normative comparisons of hospital outcomes, it is necessary to adjust raw data to accommodate for differences that result from the variety and severity of admitted cases. It is necessary also to account for individual facility characteristics that affect quality of care measures, such as the hospital's geographic location, size, teaching status, and community setting (urban versus rural).

We are able to make valid normative comparisons of mortality and complications rates by using patient-level data to control effectively for case mix and severity differences. We do this by evaluating ICD-9-CM diagnosis and procedure codes in order to adjust for severity within clinical case mix groupings. Conceptually, we group patients with similar characteristics (i.e., age, sex, principal diagnosis, procedures performed, admission type, and comorbid conditions) to produce expected, or normative, comparisons. In the same way, we group facilities with similar characteristics. Through extensive testing, we have found that this methodology produces valid normative comparisons using readily available administrative data, eliminating the need for additional data collection.

We construct a normative database of case-level data from our Projected Inpatient Data Base (PIDB) national all-payer database containing over 21 million all-payer discharges annually, obtained from approximately 2,500 hospitals, representing more than 50 percent of all discharges from short-term, general, nonfederal hospitals in the United States. The data include age, sex, length of stay, and clinical groupings — diagnosis-related groups

(DRG) or refined diagnosis-related groups (RDRG) — ICD-9-CM principal and secondary diagnoses, ICD-9-CM principal and secondary procedures, hospital identification, admission source and type, and discharge status. Hospital characteristics are obtained by linking each hospital's identification number with American Hospital Association and Medicare Cost Report data.

From the model, we exclude long-term care facilities; psychiatric, rehabilitation, or other specialty facilities; and federally-owned or -controlled facilities. Excluded patient groups are newborns, cases coded as palliative care (ICD-9-CM code V66.7), cases transferred to other short-term hospitals, and cases with stays shorter than one day.

***Note:** This section details the methods used to produce the 100 Top Hospitals®: National Benchmarks award winners. For details on the methods used to find the Everest award winners, please see the special Everest awards section of this document.*

A standard logistic regression model is used to estimate the risk of mortality or complications for each patient. This is done by weighting the patient records of the client hospital by the logistic regression coefficients associated with the corresponding terms in the model and the intercept term. This produces the expected probability of an outcome for each eligible patient (numerator) based on the experience of the norm for patients with similar characteristics (age, clinical grouping, severity of illness, and so forth) at similar institutions (hospital bed size, census division, teaching status, urban or rural community setting).²⁶⁻³⁰ This methodology also ensures that facilities are compared to other facilities with similar characteristics.

Thomson Reuters staff physicians have suggested important clinical patient characteristics that were

also incorporated into the models. After assigning the predicted probability of the outcome for each patient, the patient-level data can then be aggregated across a variety of groupings including hospital, service, or the DRGs and RDRGs classification systems, which were developed at Yale University in the 1980s.

Expected Complications Rate Index Models

Risk-adjusted complications refer to outcomes that may be of concern when they occur at a greater than expected rate among groups of patients, possibly reflecting systemic quality of care issues. The Thomson Reuters complications model uses clinical qualifiers to identify complications that have probably occurred in the inpatient setting. Examples of expected complications include wound infections, post-procedural hemorrhage, and postoperative pneumonia.

A normative database of case-level data including age, sex, length of stay, clinical grouping (DRG or RDRG), comorbid conditions, and hospital identification is constructed using our national all-payer database. Hospital characteristics are obtained by linking each hospital's identification number with American Hospital Association and Medicare Cost Report data. The method includes patients from approximately 2,500 short-term, general, nonfederal hospitals that are generally representative of short-term, general, nonfederal hospitals in the United States. Excluded groups are neonates, cases transferred to other short-term hospitals, and cases with stays shorter than one day. Also, clinical groupings such as psychiatry/mental illness, substance abuse, rehabilitation, obstetrics, and pediatrics (under 17 years of age) require special consideration with regard to complications outcomes, and so are excluded from the general risk-adjusted complications measure.

Complications rates are calculated from normative data for two patient risk groups: medical and surgical. A standard regression model is used to estimate the risk of experiencing a complication for each patient. This is done by weighting the patient records of the client hospital by the regression coefficients associated with the corresponding terms in the prediction models and intercept term. This method produces the expected probability of a complication for each patient based on the experience of the norm for patients with similar characteristics at similar institutions. After assigning the predicted probability of a complication for each patient in each risk group,

it is then possible to aggregate the patient-level data across a variety of groupings.³¹⁻³⁴

Patient Safety Indicators

The Agency for Healthcare Research and Quality (AHRQ) is a public health service agency within the federal government's Department of Health and Human Services. The agency's mission includes both translating research findings into better patient care and providing policymakers and other healthcare leaders with information needed to make critical healthcare decisions. We use AHRQ's Patient Safety Indicators (PSIs) in calculating our risk-adjusted patient safety index performance measure. This information on PSIs is from the AHRQ website (www.ahrq.gov):

The AHRQ Quality Indicators measure health care quality by using readily available hospital inpatient administrative data. Patient Safety Indicators are a set of indicators providing information on potential in-hospital complications and adverse events following surgeries, procedures, and childbirth. The PSIs were developed after a comprehensive literature review, analysis of ICD-9-CM codes, review by a clinician panel, implementation of risk adjustment, and empirical analyses. The Patient Safety Indicators provide a perspective on patient safety events using hospital administrative data. Patient Safety Indicators also reflect quality of care inside hospitals, but focus on surgical complications and other iatrogenic events.³⁵

For the risk-adjusted patient safety index performance measure, we began our research with all PSIs that occurred with sufficient frequency to generate provider-specific output. Of the 20 PSIs included in the original AHRQ methodology, only 15 produced non-zero PSI rates on the Medicare data. Four measures are for birth or other obstetrical-related conditions, which do not occur in the age group under study here. Transfusion reactions generated rates that were too low for the AHRQ PSI software to generate provider-specific output. Due to the unreliability of E coding, we also exclude complications of anesthesia (PSI 1), foreign body left in during procedure (PSI 5), postoperative hip fracture (PSI 8), and accidental puncture and laceration (PSI 15), which rely on E codes. Since the original analysis was done, PSI 2 (death in low mortality DRGs) no longer has risk values in the model. We also exclude decubitus ulcer (PSI 3) and postoperative pulmonary embolism or deep vein

thrombosis (PSI 12) because our research shows they are often present on admission. The AHRQ model version used in this study was Version 3.2 (March 2008).

The final set of eight PSIs included in the 2009 study was:

- Death among surgical inpatients with serious treatable complications (PSI 4)
- Iatrogenic pneumothorax (PSI 6)
- Selected infections due to medical care (PSI 7)
- Postoperative hemorrhage or hematoma (PSI 9)
- Postoperative physiologic and metabolic derangement (PSI 10)
- Postoperative respiratory failure (PSI 11)
- Postoperative sepsis (PSI 13)
- Postoperative wound dehiscence (PSI 14)

ECRI and PSI: Complementary Methodologies

Given its high level of importance, we chose to increase our emphasis on patient safety by using both the PSI (AHRQ) and expected complications rate index (ECRI) methodologies to calculate two separate outcome measures. Both PSI and ECRI are methodologies for identifying complications of care. Although the definitions have some similarities, there are enough differences that the two are useful complements to each other. ECRI is an overall complication methodology in which the outcome is the occurrence of one or more of 30 complications of care. Whereas the AHRQ PSIs used in our study are based on eight separate models that evaluate the occurrence of eight distinct complications of care, one of which is mortality related — an adverse outcome that is not included in ECRI.

Index Interpretation

An outcome index is a ratio of an observed number of outcomes to an expected number of outcomes in a particular population. This index is used to make normative comparisons and is standardized in that the expected number of events is based on the occurrence of the event in a normative population. The normative population used to calculate expected numbers of events is selected to be similar to the comparison population with respect to relevant characteristics including age, sex, region, and case mix.

The index is simply the number of observed events divided by the number of expected events and can be calculated for outcomes which involve counts of occurrences (e.g., deaths or complications).

Interpretation of the index relates the experience of the comparison population relative to a specified event to the expected experience based on the normative population.

Examples:

10 events observed ÷ 10 events expected = 1.0:
The observed number of events is equal to the expected number of events based on the normative experience.

10 events observed ÷ 5 events expected = 2.0:
The observed number of events is twice the expected number of events based on the normative experience.

10 events observed ÷ 25 events expected = 0.4:
The observed number of events is 60 percent lower than the expected number of events based on the normative experience.

Therefore, an index value of 1.0 indicates no difference between observed and expected outcome occurrence. An index value greater than 1.0 indicates an excess in the observed number of events relative to the expected based on the normative experience. An index value less than 1.0 indicates fewer events observed than would be expected based on the normative experience. An additional interpretation is that the difference between 1.0 and the index is the percentage difference in the number of events relative to the norm. In other words, an index of 1.05 indicates 5 percent more outcomes, and an index of 0.90 indicates 10 percent fewer outcomes than expected based on the experience of the norm. The index can be calculated across a variety of groupings (e.g., hospital, service, and DRG).

CORE MEASURES

Core Measures were developed by the Joint Commission and endorsed by the National Quality Forum (NQF), the non-profit public-private partnership organization that endorses national healthcare performance measures, as minimum basic care standards. They are a widely accepted method for measuring patient care quality that includes specific guidelines for heart attack (acute myocardial infarction (AMI)), heart failure (HF), pneumonia, pregnancy and related conditions, and surgical-infection prevention. Our composite Core Measures mean percent is based on the AMI, HF, pneumonia, and surgical-infection prevention areas of this program, using Hospital Compare

data reported on the Centers for Medicare and Medicaid Services (CMS) Web site.

In the 2009 study, we have included 24 of the 25 available Core Measures for AMI, HF, pneumonia, and surgical-infection prevention. We excluded the AMI measure “patients given fibrinolytic medication within 30 minutes of arrival” because it is under-reported in the Hospital Compare database. In addition, we excluded two Core Measures for all hospitals in the small community hospital comparison group, due to non-reporting: “Heart attack patients given PCI within 90 minutes of arrival” and “All heart surgery patients whose blood sugar (blood glucose) is kept under good control in the days right after surgery.”

In calculating each hospital’s Core Measures mean percent, the comparison group median Core Measure value was substituted for a missing Core Measure. In addition, the comparison group median Core Measure value was substituted when the hospital reported Core Measures with patient counts less than or equal to 25 or with Relative Standard Error values greater than or equal to 0.30. This was done because the original reported values were considered statistically unreliable.

AMI Core Measures

1. Patients given ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD)
2. Patients given aspirin at arrival
3. Patients given aspirin at discharge
4. Patients given beta blocker at discharge
5. Patients given PCI within 90 minutes of arrival*
6. Patients given smoking cessation advice/ counseling

HF Core Measures

7. Patients given ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD)
8. Patients given discharge instructions
9. Patients given an evaluation of left ventricular systolic (LVS) function
10. Patients given smoking cessation advice/ counseling

Pneumonia Core Measures

11. Patients given initial antibiotic(s) within six hours after arrival
12. Patients whose initial emergency room blood culture was performed prior to the administration of the first hospital dose of antibiotic(s)

13. Patients given the most appropriate initial antibiotic(s)
14. Patients given oxygenation assessment
15. Patients assessed and given pneumococcal vaccination
16. Patients assessed and given influenza vaccination
17. Patients given smoking cessation advice/ counseling

Surgical Infection Prevention Core Measures

18. Patients who were given an antibiotic at the right time (within one hour before surgery) to help prevent infection
19. Patients whose preventative antibiotics were stopped at the right time (within 24 hours after surgery)
20. Patients who were given the right kind of antibiotic to help prevent infection
21. Patients who got treatment at the right time (within 24 hours before or after their surgery) to help prevent blood clots after certain types of surgery
22. Patients whose doctors ordered treatments to prevent blood clots after certain types of surgeries
23. All heart surgery patients whose blood sugar (blood glucose) is kept under good control in the days right after surgery*
24. Patients needing hair removed from the surgical area before surgery, who had hair removed using a safer method (electric clippers or hair removal cream – not a razor)

30-DAY RISK-ADJUSTED MORTALITY RATES AND 30-DAY RISK-ADJUSTED READMISSION RATES

To help round out our balanced scorecard in the area of clinical excellence, we added a new domain – extended outcome measures – to the study this year. The first two 100 Top Hospitals® extended outcome measures are 30-day mortality and 30-day readmission rates, as defined by the CMS Hospital Compare dataset (third quarter, 2009). The longitudinal data period is July 1, 2005, through June 30, 2008. The Hospital Compare Web site and database were created by CMS, the Department of Health and Human Services, and other members of the Hospital Quality Alliance. The data on the Web site comes from hospitals that have agreed to submit quality information that will be made public. Both of the measures used in this study have been endorsed by the NQF.

* We did not include this Core Measure for small community hospitals due to very low reporting.

CMS calculates the 30-day mortality and 30-day readmission rates from Medicare enrollment and claims records using sophisticated statistical modeling techniques that adjust for patient-level risk factors and account for the clustering of patients within hospitals. Both rates are based on heart attack, heart failure, and pneumonia patients.

CMS' three mortality models (heart attack, heart failure, and pneumonia) estimate hospital-specific, risk-standardized, all-cause 30-day mortality rates for patients hospitalized with a principal diagnosis of heart attack, heart failure, and pneumonia. All-cause mortality is defined as death from any cause within 30 days after the index admission date, regardless of whether the patient dies while still in the hospital or after discharge.

CMS' three readmission models estimate hospital-specific, risk-standardized, all-cause 30-day readmission rates for patients discharged alive to a nonacute-care setting with a principal diagnosis of heart attack, heart failure, or pneumonia. Patients may have been readmitted back to the same hospital or to a different hospital or acute-care facility. They may have been readmitted for the same condition as their recent hospital stay, or for a different reason (this is to discourage hospitals from coding similar readmissions as different readmissions).²³

HCAHPS OVERALL HOSPITAL RATING

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) patient survey question rating overall hospital performance was added as the patient perception of care measure in the 2008 study. Although we are reporting hospital performance on all HCAHPS questions, only performance on the Overall Hospital Rating question is used to rank hospital performance in the study.

HCAHPS is a standardized survey instrument and data collection methodology for measuring patients' perspectives of hospital care. HCAHPS is a core set of questions that can be combined with customized, hospital-specific items to produce information that complements the data hospitals currently collect to support internal customer service and quality-related activities.

HCAHPS was developed through a partnership between CMS and AHRQ that had three broad goals:

- Produce comparable data on patients' perspectives of care that allow objective and meaningful comparisons among hospitals on topics that are important to consumers.
- Encourage public reporting of the survey results to create incentives for hospitals to improve quality of care.
- Enhance public accountability in healthcare by increasing the transparency of the quality of hospital care provided in return for the public investment.

The HCAHPS survey has been endorsed by the National Quality Forum and the Hospital Quality Alliance. The federal government's Office of Management and Budget has approved the national implementation of HCAHPS for public reporting purposes.

Voluntary collection of HCAHPS data for public reporting began in October 2006. The first public reporting of HCAHPS results, which encompassed eligible discharges from October 2006 through June 2007, occurred in March 2008. HCAHPS results were posted on the Hospital Compare Web site, found at www.hospitalcompare.hhs.gov, or through a link on www.medicare.gov. A downloadable version of HCAHPS results is available.³⁶

LENGTH OF STAY WEIGHT METHODOLOGIES

We use the Yale Refined Diagnosis-Related Group (RDRG) methodology to severity adjust length of stay. This grouper-based methodology allows us to produce risk-adjusted performance comparisons on length of stay (LOS) between or across virtually any arbitrary subgroup of inpatients. These patient groupings can be based on DRGs, hospitals, product lines, geographic regions, physicians, etc. The grouper adjusts for differences in diagnosis type and illness severity. A grouper and its associated LOS weights allow group comparisons on a national level, and in a specific market area. RDRG grouper-based weights are calculated for LOS from the largest and most representative inpatient database in existence.

Normalized LOS Weights

LOS weights are calculated for RDRGs using our nationally representative PIDB, which contains more than 21 million inpatient discharges annually. RDRG weights for Medicare patients are calculated by dividing the average LOS for each RDRG by the average LOS of all Medicare patients in the universe of short-term, general, nonfederal hospitals in the U.S.

WHY WE HAVE NOT CALCULATED PERCENT CHANGE IN SPECIFIC INSTANCES

Percent change is a meaningless statistic when the underlying quantity can be positive, negative, or zero. The actual change may mean something, but dividing it by a number that may be zero or of the opposite sign does not convey any meaningful information because the amount of change is not proportional to its previous value.³⁷

We also do not report percent change when the metrics are already percentages. In these cases, we report the simple difference between the two percentage values.

Protecting Patient Privacy

In accordance with patient privacy laws, we do not report any individual hospital data that are based on 11 or fewer patients. This affects the following measures:

- Risk-adjusted mortality index
- Risk-adjusted complications index
- 30-day mortality rate for acute myocardial infarction (AMI), heart failure, and pneumonia
- 30-day readmission rate for AMI, heart failure, and pneumonia
- Average length of stay

MEDICARE COST REPORT LINE ITEMS USED IN THE 2009 PERFORMANCE MEASURES CALCULATIONS

A number of our calculations include data from the Medicare Cost Report. Below you will find our calculations and the Cost Report locations (worksheet, line, and column) for all of these items. The following apply to the 2009 100 Top Hospitals®: National Benchmarks study and the hospital Medicare Cost Report for the hospital fiscal year ending in 2008. Please note that the locations of the elements will sometimes vary between Cost Reports. The line and column references are the standard based on CMS Form 2552-96. Any deviations from this standard are checked by system and manual data analysis to ensure that the coding has been done properly.

Expense per Adjusted Discharge, Case Mix- and Wage-Adjusted

$$\frac{[(\text{Total Adjusted Operating Expense} \times 0.62) \div \text{CMS Wage Index}] + (\text{Adjusted Operating Expense} \times 0.38)}{\text{Adjusted Discharges, Acute}} \div \text{Medicare Case Mix Index}$$
$$\text{Total Adjusted Operating Expense} = \text{Total Operating Expense} + \text{Related Organization Expense} + \text{Provider-Based Physician Expense Adjustment}$$
$$\text{Adjusted Discharges, Acute} = [\text{Discharges, Total Hospital, All Patients} \times \text{Adjustment Factor}]$$
$$\text{Adjustment Factor} = \frac{\text{Total Patient Revenue} \div (\text{Total Inpatient Revenue} - (\text{Total Revenue, Sub I} + \text{Total Revenue, Sub II} + \text{Total Revenue, Sub III} + \text{Total Revenue, SNF} + \text{Total Revenue, ICF} + \text{Total Revenue Other LTC}))}{1}$$

Individual Element Locations in the Medicare Cost Report:

- Total Operating Expense—Worksheet G-3, Line 4, Column 1
- Related Organization Expense—Worksheet A-8, Line 14, Column 2
- Provider-Based Physician Expense (related to direct patient care)—Worksheet A-8, Line 12, Column 2
- Discharges, Total Hospital, All Patients—Worksheet S-3, Line 12, Column 15
- Total Patient Revenue—Worksheet G-3, Line 1 or G-2, Line 25, Column 3
- Total Inpatient Revenue—Worksheet G-2, Line 25, Column 1
- Total Revenue, Sub I—Worksheet G-2, Line 2, Column 3
- Total Revenue, Sub II—Worksheet G-2, Line 2.01, Column 3
- Total Revenue, Sub III—Worksheet G-2, Line 2.02, Column 3
- Total Revenue, SNF—Worksheet G-2, Line 6, Column 3
- Total Revenue, ICF—Worksheet G-2, Line 7, Column 3
- Total Revenue, Other LTC—Worksheet G-2, Line 8, Column 3
- Medicare Case Mix Index—Federal Register: CMS Inpatient Prospective Payment System (IPPS) Fiscal Year 2009 Final Rule
- CMS Wage Index—CMS Federal Register: CMS IPPS Fiscal Year 2009 Final Rule

Operating Profit Margin (Profitability)

$$\frac{[(\text{Net Patient Revenue} + \text{Other Operating Revenue} - (\text{Total Operating Expense} + \text{Related Organization Expense})) \div (\text{Net Patient Revenue} + \text{Other Operating Revenue})] \times 100}{}$$

Other Operating Revenue = [Total Other Income - Other Income: Contributions, Donations, etc. - Other Income from Investments]

Individual Element Locations in the Medicare Cost Report:

- Net Patient Revenue—Worksheet G-3, Line 3, Column 1
- Total Other Income—Worksheet G-3, Line 25, Column 1
- Other Income: Contributions, Donations, Etc.—Worksheet G-3, Line 6, Column 1
- Other Income from Investments—Worksheet G-3, Line 7, Column 1
- Total Operating Expense—Worksheet G-3, Line 4, Column 1
- Related Organization Expense—Worksheet A-8, Line 14, Column 2

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