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The Fourth Annual HealthGrades America's 50 Best Hospitals Report

February 2010

Author: Lauren Galloway; **Co-author**: Rick May, M.D.
Major Contributors: Carol Nicholas, M.S.T.C., editing and publishing
Harold Taylor, Ph.D. and Alex Brown, statistical analysis

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Executive Summary

For the fourth consecutive year, HealthGrades identified 50 hospitals that have provided outstanding clinical quality year after year and recognizes these hospitals as America's 50 Best Hospitals (A50B). These hospitals have received the HealthGrades Distinguished Hospital Award for Clinical Excellence™ (DHA-CE) for the most consecutive years of the eight years HealthGrades has designated this award (from 2003-2010).

Since its inception more than a decade ago, HealthGrades has embraced the principles of empowerment, transparency and accountability that have dominated the health care reform discussions for the past year. One of the few topics all can agree with in the health care reform debate is addressing the variation in the quality of care. Congress has pushed for a broader and faster plan to implement value-based purchasing to address this variation. Initiatives such as pay-for-performance exist in many forms, including an expanded list of hospital-acquired conditions that are no longer paid for by the Centers for Medicare and Medicaid Services (CMS). Such initiatives recognize that there are standards for quality to which U.S. hospitals must adhere. The government will align such incentives by financially penalizing hospitals that are performing at a lower standard.

HealthGrades has been rating hospitals based on quality outcomes (risk-adjusted inhospital mortality and complication rates) for over a decade and displays every nonfederal hospital's performance for 26 diagnoses and procedures on www.HealthGrades.com. The goal is to provide consumers with objective, comparative information on hospitals so they can make more informed decisions. Each year, HealthGrades finds substantial gaps in clinical quality when comparing the best-performing hospitals to the poor- and average-performing hospitals.

Hospitals that rank among the top 5% in the nation for the lowest risk-adjusted morality and inhospital complications across 26 diagnoses and procedures as measured by HealthGrades over a three-year period are identified as Distinguished Hospitals for Clinical Excellence. For the past four years, HealthGrades found that a subset of these hospitals were *consistently* Distinguished Hospital for Clinical Excellence award recipients; these hospitals were recognized as America's 50 Best Hospitals. All America's 50 Best Hospitals were DHA-CE recipients for at least the last six years, and 34 were DHA-CE recipients in all eight years.

If all hospitals performed at the level of A50B hospitals across 17 procedures and conditions, 164,964 Medicare lives could potentially have been saved.

Overall, the America's 50 Best Hospitals outperformed all other hospitals from 2006 through 2008. They had lower risk-adjusted inhospital mortality and improved their mortality rates faster than all other hospitals nationwide. All hospitals experienced an increase in risk-adjusted inhospital complications from 2006 through 2008, but America's 50 Best Hospitals still had lower risk-adjusted inhospital complications overall. If all hospitals performed at this level, 164,964 Medicare lives could potentially have been saved and 18,900 Medicare inhospital complications could potentially have been avoided. Patients who choose to receive their care at an America's 50 Best Hospital will most likely have a lower risk for an adverse clinical outcome relative to all other hospitals.

Summary of Findings

Patients have on average a 26.96% lower chance of dying at the nation's A50B Hospitals compared to all other hospitals across 17 procedures and conditions.

HealthGrades America's 50 Best Hospitals are those hospitals that have year over year ranked among the top 5% in the nation for clinical quality. These elite organizations represent the best of the top-performing hospitals and set the quality standard for American hospitals. HealthGrades America's 50 Best Hospitals have lower risk-adjusted inhospital mortality and lower risk-adjusted inhospital complications compared to all other hospitals. During the period from 2006 through 2008, they had:

- Overall 26.96% lower risk-adjusted inhospital mortality across 17 procedures and diagnoses where inhospital mortality was the outcome studied.

  Risk-adjusted inhospital mortality was lower at America's 50 Best Hospitals for all 17 procedures and diagnoses. In fact, risk-adjusted inhospital mortality at America's 50 Best Hospitals ranged from 14.70% to 44.52% lower than all other hospitals (see *Appendix B*).

- Overall 8.29% lower risk-adjusted inhospital complications across nine procedures where the inhospital complication rate was the outcome studied.

  Risk-adjusted inhospital complications were lower at America's 50 Best Hospitals for eight of the nine complication-based procedures studied (see *Appendix C*).

From 2006 through 2008, if all hospitals performed at the level of America's 50 Best Hospitals:

- 164,964 Medicare deaths may have been prevented.
- 18,900 Medicare inhospital complications may have been avoided.

Three-Step Methodology

In order to evaluate overall hospital performance and to identify the 50 best-performing hospitals in clinical excellence across the U.S., HealthGrades uses a three-step methodology:

1. Mortality and Complication Based Outcomes Methodology
2. Distinguished Hospital Award for Clinical Excellence™ Methodology
3. HealthGrades America's 50 Best Hospitals Methodology

The *Fourth Annual HealthGrades America's 50 Best Hospitals Report* concentrates on the 26 procedures and diagnoses for which HealthGrades has developed predictive logistic regression models. The 26 procedures and diagnoses are as follows.

Mortality-Based Procedures and Diagnoses	
• Bowel Obstruction	• Heart Failure
• Chronic Obstructive Pulmonary Disease	• Pancreatitis
• Coronary Bypass Surgery	• Pneumonia
• Coronary Interventional Procedures (Angioplasty/Stent)	• Pulmonary Embolism
• Diabetic Acidosis and Coma	• Resection/Replacement of Abdominal Aorta
• Gastrointestinal Bleed	• Respiratory Failure
• Gastrointestinal Surgeries and Procedures	• Sepsis
• Heart Attack (Acute Myocardial Infarction)	• Stroke
	• Valve Replacement Surgery
Complication-Based Procedures	
• Back and Neck Surgery (Spinal Fusion)	• Hip Fracture Repair
• Back and Neck Surgery (except Spinal Fusion)	• Peripheral Vascular Bypass
• Carotid Surgery	• Prostatectomy
• Cholecystectomy	• Total Hip Replacement
	• Total Knee Replacement

Mortality and Complication Based Outcomes 2010 Methodology Brief (Step 1)

To help consumers evaluate and compare hospital performance, HealthGrades analyzes patient outcome data for virtually every hospital in the country. HealthGrades purchased the initial data from the Centers for Medicare and Medicaid Services (CMS). The Medicare data (MedPAR file) from CMS contain approximately 40 million inpatient records for Medicare hospitalizations from 2006 through 2008.

Using a logistic-regression based risk-adjustment model to compare performance among hospitals, each hospital is assigned one of three star ratings: 1-star (poor), 3-star (as expected), or 5-star (best) for each of the above patient groups. The purpose of risk adjustment is to obtain fair statistical comparisons among disparate populations or groups. Significant differences in demographic and clinical risk factors are found among patients treated in different hospitals; and therefore, risk adjustment of the data is needed to make accurate and valid comparisons of clinical outcomes at different hospitals. This is important because in health care, patients differ from one another with respect to their health status, demographics, and type of procedure performed. Risk factors include gender, age, specific procedure performed, and current health conditions such as hypertension, diabetes, and congestive heart failure. The risk adjustment used by HealthGrades takes these factors into consideration to make fair and accurate comparisons of hospitals based upon the types of patients treated.

Developing ratings involves two steps:

- First, the **predicted** value for a specific outcome is calculated.
- Second, the predicted outcome is compared to the **actual outcome**.

HealthGrades determines if the difference between the predicted outcome and the actual outcome was statistically significant.

The following rating system was applied to the data for all procedures and diagnoses:

★★★★★ Actual performance was better than predicted and the difference was statistically significant.

★★★ Actual performance was not statistically different from what was predicted.

★ Actual performance was worse than predicted and the difference was statistically significant.

In general, 70% to 80% of hospitals in each procedure/diagnosis are classified as three stars, with actual results statistically the same as predicted results. Approximately 10% to 15% are 1-star hospitals and 10% to 15% are 5-star hospitals.

Visit www.HealthGrades.com to view hospital ratings and to read the complete methodology *Hospital Report Cards™ Mortality and Complication Based Outcomes 2010 Methodology*.

Distinguished Hospital Award for Clinical Excellence™ 2010 Methodology (Step 2)

To be considered for a HealthGrades Distinguished Hospital Award for Clinical Excellence, a hospital must have star ratings in at least 19 of the 26 HealthGrades procedures and diagnoses ratings using MedPAR data.

After creating a list of hospitals that met the above criteria, HealthGrades took the following steps to determine the Distinguished Hospital Award for Clinical Excellence recipients:

1. Calculated the average star rating and average z-score for each hospital by averaging all of their MedPAR-based ratings and the corresponding z-scores.
2. Ranked hospitals in descending order by their average star rating, with ties broken by average z-score.
3. Selected the top 269 hospitals on the list (which represents the top 5% of all hospitals).
4. Designated these hospitals as Distinguished Hospital Award for Clinical Excellence recipients.

HealthGrades America's 50 Best Hospitals 2010 Methodology (Step 3)

HealthGrades America's 50 Best Hospitals Award recognizes hospitals for consistent excellence by identifying those hospitals that have received a HealthGrades Distinguished Hospital Award for Clinical Excellence for the most consecutive years of the eight years HealthGrades has designated this award. To identify America's 50 Best Hospitals, HealthGrades used a two-step process:

1. Hospitals that were Distinguished Hospital Award for Clinical Excellence recipients for all of the last seven years, or the last eight years, were identified.
2. Hospitals that were Distinguished Hospital Award for Clinical Excellence recipients for all of the last six years were identified.
   - The six-year recipients were sorted by z-score, using the average z-score from the most recent Distinguished Hospital Award for Clinical Excellence analysis. The average z-score is a statistical measure of hospital quality outcomes.
   - The top hospitals from this list were then added to the list from step 1 to create a list of America's 50 Best Hospitals.

Interpretation of Results

The HealthGrades America's 50 Best Hospitals Award designation recognizes hospitals that demonstrated superior and sustained clinical quality over a ten-year time period, based upon an analysis of more than 130 million Medicare patient records from 1999 through 2008 (the most recent year available).

HealthGrades America's 50 Best Hospitals were selected by identifying those hospitals that have received the HealthGrades Distinguished Hospital Award for Clinical Excellence for the most consecutive years. Hospitals that are recognized with a HealthGrades Distinguished Hospital Award for Clinical Excellence rank among the top 5% nationally for quality. America's 50 Best Hospitals consistently outperformed all other hospitals across all procedures and diagnoses studied.

A50B Hospitals had on Average 26.96% Lower Risk-Adjusted Inhospital Mortality

A50B Hospitals had 26.96% lower risk-adjusted inhospital mortality and 8.29% lower risk-adjusted inhospital complications compared to all other hospitals.

When compared to all other hospitals, America's 50 Best Hospitals had a 26.96% overall lower risk-adjusted inhospital mortality rate associated with the 17 procedures and diagnoses studied where mortality was studied as the outcome.

The top four areas associated with the greatest relative reduction in risk-adjusted inhospital mortality associated with America's 50 Best Hospitals, as compared to all other hospitals, are noted in *Table 1*.

Table 1. Relative Reduction in Risk-Adjusted Inhospital Mortality Associated with America's 50 Best Hospitals Compared to All Other Hospitals

Procedure / Diagnosis	Relative Reduction in Risk-Adjusted Inhospital Mortality Associated with America's 50 Best Hospitals Compared to All Other Hospitals*
Chronic Obstructive Pulmonary Disease	44.52% lower risk-adjusted mortality
Pneumonia	40.25% lower risk-adjusted mortality
Gastrointestinal Bleed	33.12% lower risk-adjusted mortality
Bowel Obstruction	32.83 % lower risk-adjusted mortality

* Relative Risk Reduction is the difference in observed to expected performance between A50B hospitals and all other hospitals. For complete results and methodology, see *Appendix B*.

A50B Hospitals had on Average 8.29% Lower Risk-Adjusted Inhospital Complications

When compared to all other hospitals, America's 50 Best Hospitals had an 8.29% overall lower inhospital risk-adjusted complications rate associated with the nine procedures studied where major inhospital complications were studied.

The top three areas associated with the greatest relative reduction in risk-adjusted inhospital complications associated with America's 50 Best Hospitals, as compared to all other hospitals, are noted in *Table 2*.

Table 2. Relative Reduction in Risk-Adjusted Complications Associated with America's 50 Best Hospitals Compared to All Other Hospitals

Procedure / Diagnosis	Relative Reduction in Risk-Adjusted Complications Associated with America's 50 Best Hospitals Compared to All Other Hospitals*
Peripheral Vascular Bypass	16.77% fewer risk-adjusted inhospital major complications
Prostatectomy	14.54% fewer risk-adjusted inhospital major complications
Total Hip Replacement	14.47% fewer risk-adjusted inhospital major complications

* Relative Risk Reduction is the difference in observed to expected performance between A50B hospitals and all other hospitals. For complete results and methodology, see *Appendix C*.

Seventeen States have One or More HealthGrades America's 50 Best Hospitals

Half of America's 50 Best Hospitals are located in three states: Ohio (18%), Florida (18%), and Pennsylvania (14%).

Seventeen states have at least one hospital recognized as a HealthGrades America's 50 Best Hospital as illustrated in the map below. Half of America's 50 Best Hospitals are located in three states: Ohio (18%), Florida (18%), and Pennsylvania (14%). This year Maryland joined the list of states that have at least one HealthGrades America's 50 Best Hospital. See *Table 3* for the number of America's 50 Best Hospitals in each state.

States with at least one HealthGrades America's 50 Best Hospital
(Number of A50B Hospitals by State)

Seventeen states have one or more HealthGrades 2010 America's 50 Best Hospitals.

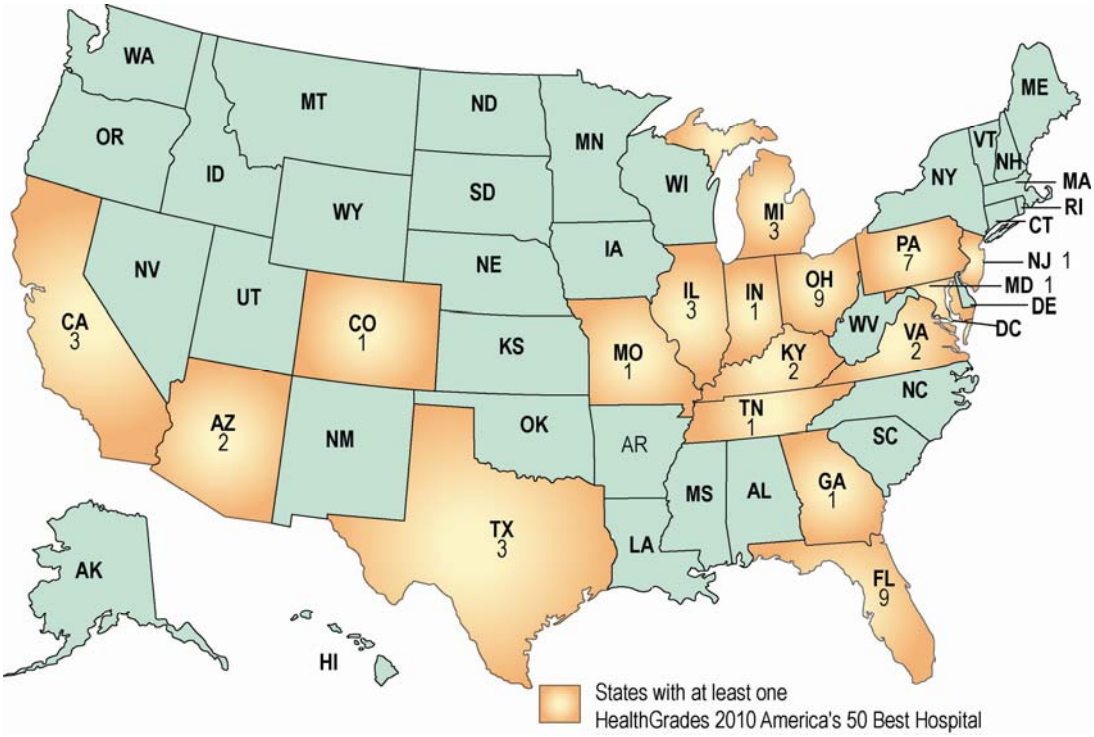

Table 3. America's 50 Best Hospitals Distribution by State

State / Abbreviation		Number of DHA-CE Eligible Hospitals In State	Number of A50B Hospitals In State	% of Hospitals in State that are A50B Hospitals	% of all A50B Hospitals
Alabama	AL	97	0	- -	- -
Alaska	AK	16	0	- -	- -
Arizona	AZ	72	2	2.78%	4.00%
Arkansas	AR	76	0	- -	- -
California	CA	323	3	0.93%	6.00%
Colorado	CO	65	1	1.54%	2.00%
Connecticut	CT	31	0	- -	- -
Delaware	DE	5	0	- -	- -
Dist. Of Columbia	DC	7	0	- -	- -
Florida	FL	179	9	5.03%	18.00%
Georgia	GA	141	1	0.71%	2.00%
Hawaii	HI	15	0	- -	- -
Idaho	ID	35	0	- -	- -
Illinois	IL	183	3	1.64%	6.00%
Indiana	IN	117	1	0.85%	2.00%
Iowa	IA	113	0	- -	- -
Kansas	KS	124	0	- -	- -
Kentucky	KY	95	2	2.11%	4.00%
Louisiana	LA	113	0	- -	- -
Maine	ME	36	0	- -	- -
Maryland	MD	46	1	2.17%	2.00%
Massachusetts	MA	63	0	- -	- -
Michigan	MI	125	3	2.40%	6.00%
Minnesota	MN	119	0	- -	- -
Mississippi	MS	89	0	- -	- -
Missouri	MO	111	1	0.90%	2.00%
Montana	MT	47	0	- -	- -
Nebraska	NE	82	0	- -	- -
Nevada	NV	30	0	- -	- -
New Hampshire	NH	26	0	- -	- -
New Jersey	NJ	71	1	1.41%	2.00%
New Mexico	NM	40	0	- -	- -
New York	NY	188	0	- -	- -
North Carolina	NC	110	0	- -	- -
North Dakota	ND	42	0	- -	- -
Ohio	OH	158	9	5.70%	18.00%
Oklahoma	OK	114	0	- -	- -
Oregon	OR	56	0	- -	- -
Pennsylvania	PA	160	7	4.38%	14.00%
Rhode Island	RI	10	0	- -	- -
South Carolina	SC	59	0	- -	- -
South Dakota	SD	54	0	- -	- -
Tennessee	TN	114	1	0.88%	2.00%
Texas	TX	361	3	0.83%	6.00%
Utah	UT	37	0	- -	- -
Vermont	VT	14	0	- -	- -
Virginia	VA	80	2	2.50%	4.00%
Washington	WA	76	0	- -	- -
West Virginia	WV	51	0	- -	- -
Wisconsin	WI	119	0	- -	- -
Wyoming	WY	22	0	- -	- -

Recognizing Consistent Quality Outcomes as an Important Benchmark

This year's report found that 164,964 lives could potentially have been saved and 18,900 inhospital major complications could potentially have been avoided if all Medicare patients, who were admitted to U.S. hospitals between 2006 and 2008 with any of the 26 conditions studied, were treated in hospitals that performed at the level of America's 50 Best Hospitals. Considering that this report evaluates just 26 diagnoses and procedures and only Medicare patients, it is likely that the number of avoidable mortalities and complications could be vastly greater if measured for all patients.

In conclusion, given the health care climate today with reform on the horizon, HealthGrades continues to identify the top-performing hospitals in terms of risk-adjusted inhospital mortality and risk-adjusted inhospital major complications in order to support transparency and accountability and improve health care for our nation. HealthGrades identified America's 50 Best Hospitals to recognize consistent quality outcomes, an increasingly important benchmark in today's health care arena.

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Health Grades Inc. is the leading independent healthcare ratings organization, providing quality ratings, profiles and cost information on the nation's hospitals, physicians, nursing homes and prescription drugs.

Appendix A: HealthGrades 2010 America's 50 Best Hospitals

* Distinction cannot be used without a Licensing Agreement from Health Grades, Inc.

HealthGrades 2010 America's 50 Best Hospitals*	City
Arizona	
Banner Del E. Webb Medical Center	Sun City West
Mayo Clinic Hospital	Phoenix
California	
Glendale Memorial Hospital & Health Center	Glendale
Good Samaritan Hospital	Los Angeles
Saint John's Hospital Health Center	Santa Monica
Colorado	
Centura Health Penrose – St. Francis Health Services	Colorado Springs
Florida	
Bay Medical Center	Panama City
Central Florida Regional Hospital	Sanford
Delray Medical Center	Delray Beach
Florida Hospital Memorial Medical Center	Daytona Beach
including: Florida Hospital Oceanside	Ormond Beach
Lawnwood Regional Medical Center and Heart Institute	Fort Pierce
Munroe Regional Medical Center	Ocala
Ocala Regional Medical Center/West Marion Hospital	Ocala
Palm Beach Gardens Medical Center	Palm Beach Gardens
Sarasota Memorial Hospital	Sarasota
Georgia	
Saint Joseph's Hospital of Atlanta	Atlanta
Illinois	
Alexian Brothers Medical Center	Elk Grove Village
Evanston Hospital	Evanston
including: Highland Park Hospital	Highland Park
Skokie Hospital	Skokie
Indiana	
Community Hospital	Munster
Kentucky	
Baptist Hospital East	Louisville
St. Elizabeth Edgewood	Edgewood
Maryland	
Greater Baltimore Medical Center	Baltimore
Michigan	
Beaumont Hospital – Royal Oak	Royal Oak

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HealthGrades 2010 America's 50 Best Hospitals* continued	City
Genesys Regional Medical Center	Grand Blanc
Munson Medical Center	Traverse City
Missouri	
St. Luke's Hospital	Chesterfield
New Jersey	
Hackensack University Medical Center	Hackensack
Ohio	
Akron General Medical Center	Akron
Christ Hospital	Cincinnati
Grandview Medical Center	Dayton
Hillcrest Hospital	Mayfield Heights
Marymount Hospital	Garfield Heights
Parma Community General Hospital	Parma
Southwest General Health Center	Middleburg Heights
St. John West Shore Hospital	Westlake
Summa Akron City and St. Thomas Hospitals	Akron
Pennsylvania	
Easton Hospital	Easton
Hamot Medical Center	Erie
Lancaster General Hospital	Lancaster
Lehigh Valley Hospital	Allentown
Main Line Hospitals – Lankenau	Wynnewood
Mercy Hospital – Scranton	Scranton
St. Luke's Hospital	Bethlehem
including: St. Luke's Hospital – Allentown	Allentown
Tennessee	
Memorial Healthcare System	Chattanooga
Texas	
CHRISTUS Santa Rosa Healthcare – San Antonio	San Antonio
Memorial Hermann Healthcare System – Southwest Hospitals	Houston
including: Memorial Hermann Northwest Hospital	Houston
Memorial Hermann Southeast Hospital	Houston
Memorial Hermann The Woodlands Hospital	The Woodlands
Rio Grande Regional Hospital	McAllen
Virginia	
Henrico Doctors' Hospital – Forest	Richmond
including: Henrico Doctors' Hospital – Parham	Richmond
Inova Fairfax Hospital	Falls Church

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Appendix B: Inhospital Mortality Performance: America's 50 Best Hospitals Compared to All Other U.S. Hospitals

(3-Year Aggregate Relative Risk-Adjusted Inhospital Mortality Performance: 2006-2008)

Procedure or Diagnosis	Year	Total Number of U.S. Medicare Hospitalizations	A50B Hospitals Average Observed-to-Expected Inhospital Mortality Ratio	% Improvement by A50B Hospitals[1]	All Other U.S. Hospitals Average Observed-to-Expected Inhospital Mortality Ratio	% Improvement by All Other Hospitals[2]	Relative Risk Reduction Associated with A50B Hospitals Compared to All Other U.S. Hospitals[3]	Number of Lives That Could Have Been Saved If All Patients were Treated at A50B Hospitals (2006-2008)[4]	*P*-Value (A50B Hospital Mortality Compared to National Mortality Average)
Bowel Obstruction	2006	150,810	.79		1.05				.001
	2007	147,947	.59		.99				<.001
	2008	153,394	.66		1.00				<.001
	2006-2008	452,151	.68	16.95%	1.01	4.30%	32.83%	4,647	<.001
Chronic Obstructive Pulmonary Disease (COPD)	2006	329,033	.59		1.14				<.001
	2007	316,165	.55		1.03				<.001
	2008	373,110	.55		.91				<.001
	2006-2008	1,018,308	.56	6.88%	1.02	20.50%	44.52%	8,467	<.001
Coronary Bypass Surgery	2006	90,297	1.09		1.08				.862
	2007	82,740	.80		1.00				.007
	2008	76,361	.66		.94				<.001
	2006-2008	249,398	.86	39.64%	1.01	13.27%	14.70%	924	.002
Coronary Interventional Procedures (Angioplasty/ Stent)	2006	323,383	.80		1.08				.001
	2007	284,950	.83		1.00				.005
	2008	261,144	.72		.98				<.001
	2006-2008	869,477	.78	9.66%	1.02	9.46%	23.57%	2,662	<.001
Diabetic Acidosis and Coma	2006	54,085	.61		.99				.013
	2007	53,600	.86		1.03				.219
	2008	54,759	.73		1.02				.058
	2006-2008	162,444	.73	-19.33%	1.01	-2.81%	27.67%	675	.004
Gastrointestinal Bleed	2006	261,394	.71		1.11				<.001
	2007	251,910	.63		.99				<.001
	2008	245,583	.69		.95				<.001
	2006-2008	758,887	.68	2.47%	1.01	15.08%	33.12%	4,938	<.001

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Procedure or Diagnosis	Year	Total Number of U.S. Medicare Hospitalizations	A50B Hospitals Average Observed-to-Expected Inhospital Mortality Ratio	% Improvement by A50B Hospitals[1]	All Other U.S. Hospitals Average Observed-to-Expected Inhospital Mortality Ratio	% Improvement by All Other Hospitals[2]	Relative Risk Reduction Associated with A50B Hospitals Compared to All Other U.S. Hospitals[3]	Number of Lives That Could Have Been Saved If All Patients were Treated at A50B Hospitals (2006-2008)[4]	*P*-Value (A50B Hospital Mortality Compared to National Mortality Average)
Gastrointestinal Surgeries and Procedures	2006	81,348	.75		1.05				<.001
	2007	79,648	.69		.99				<.001
	2008	80,305	.81		1.00				<.001
	2006-2008	241,301	.75	-7.71%	1.01	5.06%	25.94%	6,069	<.001
Heart Attack	2006	244,954	.85		1.06				<.001
	2007	233,731	.85		1.00				<.001
	2008	232,202	.75		.96				<.001
	2006-2008	710,887	.82	12.52%	1.01	9.37%	18.99%	12,823	<.001
Heart Failure	2006	613,332	.73		1.08				<.001
	2007	570,903	.71		.97				<.001
	2008	536,230	.67		.99				<.001
	2006-2008	1,720,465	.70	9.10%	1.01	7.73%	30.53%	19,297	<.001
Pancreatitis	2006	50,316	.70		1.06				.011
	2007	48,368	.77		1.05				.055
	2008	46,423	.73		.93				.026
	2006-2008	145,107	.73	-4.47%	1.01	12.06%	27.52%	1,013	<.001
Pneumonia	2006	513,531	.65		1.09				<.001
	2007	484,840	.58		.99				<.001
	2008	454,662	.58		.96				<.001
	2006-2008	1,453,033	.61	10.59%	1.01	11.77%	40.25%	28,350	<.001
Pulmonary Embolism	2006	50,618	.79		1.12				.017
	2007	52,464	.67		1.01				<.001
	2008	51,252	.64		.93				<.001
	2006-2008	154,334	.70	19.92%	1.02	17.58%	31.17%	2,092	<.001
Resection/Replacement of Abdominal Aorta	2006	21,535	.91		1.05				.248
	2007	21,387	.83		1.02				.115
	2008	20,990	.81		.95				.095
	2006-2008	63,912	.85	11.03%	1.01	10.13%	15.63%	431	.033

Procedure or Diagnosis	Year	Total Number of U.S. Medicare Hospitalizations	A50B Hospitals Average Observed-to-Expected Inhospital Mortality Ratio	% Improvement by A50B Hospitals[1]	All Other U.S. Hospitals Average Observed-to-Expected Inhospital Mortality Ratio	% Improvement by All Other Hospitals[2]	Relative Risk Reduction Associated with A50B Hospitals Compared to All Other U.S. Hospitals[3]	Number of Lives That Could Have Been Saved If All Patients were Treated at A50B Hospitals (2006-2008)[4]	*P*-Value (A50B Hospital Mortality Compared to National Mortality Average)
Respiratory Failure	2006	144,514	.85		1.06				<.001
	2007	143,122	.83		1.01				<.001
	2008	157,129	.76		.95				<.001
	2006-2008	444,765	.81	10.66%	1.01	10.72%	19.51%	17,776	<.001
Sepsis	2006	257,026	.81		1.08				<.001
	2007	269,596	.75		1.01				<.001
	2008	309,808	.75		.96				<.001
	2006-2008	836,430	.77	7.34%	1.01	11.53%	24.07%	41,503	<.001
Stroke	2006	220,937	.81		1.07				<.001
	2007	210,085	.71		1.01				<.001
	2008	206,846	.70		.95				<.001
	2006-2008	637,868	.74	13.58%	1.01	11.18%	26.71%	11,736	<.001
Valve Replacement Surgery	2006	38,424	.82		1.12				.007
	2007	37,275	.85		1.02				.026
	2008	37,654	.72		.91				<.001
	2006-2008	113,353	.80	11.09%	1.01	18.23%	21.55%	1,561	<.001
Totals		10,032,120						164,964	
3-Year Performance Averages			0.74	8.82%	1.01	10.89%	26.96%		

1 Percent improvement determines improvement over time (2006 through 2008) for aggregate A50B hospitals. Calculated as follows: (O/E for 2006 – O/E for 2008) / (O/E for 2006) where the O/E is for the A50B hospitals.

2 Percent improvement determines improvement over time (2006 through 2008) for aggregate Non-A50B hospitals. Calculated as follows: (O/E for 2006 – O/E for 2008) / (O/E for 2006) where the O/E is for the Non-A50B hospitals.

3 Relative Risk Reduction determines the difference in performance between A50B and all other hospitals. Calculated as follows: (Non- A50B O/E – A50B O/E) / Non-A50B O/E.

4 Lives saved were calculated: Non-A50B hospitals' 3-year actual number of mortalities – (Non-A50B hospitals' 3-year expected number of mortalities x A50B O/E ratio).

Appendix C: Inhospital Complications Performance: America's 50 Best Hospitals Compared to All Other U.S. Hospitals

(3-Year Aggregate Relative Risk-Adjusted Inhospital Complications Performance: 2006-2008)

Procedure or Diagnosis	Year	Total Number of U.S. Medicare Hospitalizations	Total Number of A50B Hospitalizations	A50B Hospitals Average Observed-to-Expected Inhospital Complications Ratio	% Improvement by A50B Hospitals[1]	All Other U.S. Hospitals Average Observed-to-Expected Inhospital Complications Ratio	% Improvement by All Other Hospitals[2]	Relative Risk Reduction Associated with A50B Hospitals Compared to All Other U.S. Hospitals[3]	Number of Patients That Could Have Avoided Developing One or More Post-Op Complications If All Patients were Treated at A50B Hospitals (2006-2008)[4]	*P*-Value (A50B Hospital Complications Compared to National Complication Average)
Back and Neck Surgery (Spinal Fusion)	2006	57,894	2,986	0.93		1.00				.050
	2007	60,237	3,026	0.86		0.98				<.001
	2008	65,146	3,257	1.04		1.02				.793
	2006-2008	183,277	9,269	0.94	-11.64%	1.00	-1.75%	6.15%	1,792	.011
Back and Neck Surgery (Except Spinal Fusion)	2006	64,838	3,257	0.93		0.97				.090
	2007	60,836	2,956	1.03		1.00				.681
	2008	61,968	2,803	1.09		1.03				.941
	2006-2008	187,642	9,016	1.01	-16.68%	1.00	-6.96%	-1.06%	-215	.628
Carotid Surgery	2006	79,152	4,056	0.94		1.00				.172
	2007	75,556	3,781	0.97		0.97				.294
	2008	72,567	3,721	0.99		1.04				.439
	2006-2008	227,275	11,558	0.97	-4.91%	1.00	-3.91%	3.44%	534	.171
Cholecystectomy	2006	95,524	3,535	0.98		0.99				.277
	2007	91,343	3,500	0.96		0.99				.191
	2008	89,668	3,479	0.97		1.03				.260
	2006-2008	276,535	10,514	0.97	.21%	1.00	-3.47%	3.08%	1,262	.112
Hip Fracture Repair	2006	179,727	6,729	0.90		1.00				.001
	2007	175,175	6,648	0.90		0.97				.002
	2008	175,631	6,928	0.98		1.05				.250
	2006-2008	530,533	20,305	0.93	-9.19%	1.00	-4.91%	7.69%	4,884	<.001

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Procedure or Diagnosis	Year	Total Number of U.S. Medicare Hospitalizations	Total Number of A50B Hospitalizations	A50B Hospitals Average Observed-to-Expected Inhospital Complications Ratio	% Improvement by A50B Hospitals[1]	All Other U.S. Hospitals Average Observed-to-Expected Inhospital Complications Ratio	% Improvement by All Other Hospitals[2]	Relative Risk Reduction Associated with A50B Hospitals Compared to All Other U.S. Hospitals[3]	Number of Patients That Could Have Avoided Developing One or More Post-Op Complications If All Patients were Treated at A50B Hospitals (2006-2008)[4]	*P*-Value (A50B Hospital Complications Compared to National Complication Average)
Peripheral Vascular Bypass	2006	23,662	1,095	0.94		1.01				.258
	2007	20,648	914	0.73		1.02				.007
	2008	19,114	918	0.83		1.00				.052
	2006-2008	63,424	2,927	0.84	11.49%	1.01	0.43%	16.77%	912	.004
Prostatectomy	2006	72,083	3,465	0.91		1.04				.087
	2007	68,707	3,352	0.76		1.00				<.001
	2008	66,748	3,182	0.92		0.99				.133
	2006-2008	207,538	9,999	0.86	-1.90%	1.01	4.95%	14.54%	1,760	<.001
Total Hip Replacement	2006	95,004	4,989	0.83		0.98				<.001
	2007	95,449	4,854	0.78		0.97				<.001
	2008	99,558	5,192	0.97		1.07				.268
	2006-2008	290,011	15,035	0.86	-16.83%	1.01	-9.77%	14.47%	3,119	<.001
Total Knee Replacement	2006	246,608	11,587	0.89		1.01				<.001
	2007	244,754	11,501	0.86		0.98				<.001
	2008	253,905	11,709	0.98		1.03				.243
	2006-2008	745,267	34,797	0.91	-10.24%	1.00	-1.88%	9.54%	4,852	<.001
Totals		2,711,502	123,420						18,900	
3-Year Performance Average				0.92	-6.63%	1.00	-3.03%	8.29%		

[1] Percent improvement determines improvement over time (2006 through 2008) for aggregate A50B hospitals. Calculated as follows: (O/E for 2006 – O/E for 2008) / (O/E for 2006) where the O/E is for the A50B hospitals.

[2] Percent improvement determines improvement over time (2006 through 2008) for aggregate Non-A50B hospitals. Calculated as follows: (O/E for 2006 – O/E for 2008) / (O/E for 2006) where the O/E is for the Non-A50B hospitals.

[3] Relative Risk Reduction determines the difference in performance between A50B and all other hospitals. Calculated as follows: (Non-A50B O/E – A50B O/E) / Non-A50B O/E.

[4] Complications avoided were calculated: Non-A50B hospitals' 3-year actual number of complications – (Non-A50B hospitals' 3-year expected number of complications x A50B O/E ratio).