

Coronary Artery Bypass Graft Surgery in California: 2005-2006 Hospital & Surgeon Data

California CABG Outcomes Reporting Program



Office of Statewide Health Planning and Development

THE CALIFORNIA REPORT ON
CORONARY ARTERY
BYPASS GRAFT SURGERY

2005-2006 Hospital and Surgeon Data

March 2009

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Additional copies of the report can be obtained through the OSHPD Web site (www.oshpd.ca.gov).

PREFACE

March 2009

We are pleased to share with you the fourth public release of data from the State's mandatory heart bypass surgery reporting program. This report focuses on surgeon performance in 2005-2006 and provides the risk-adjusted mortality rates and performance ratings for all 284 cardiac surgeons who performed heart bypass surgery during 2005 or 2006. This report also provides quality ratings for 121 state-licensed hospitals that performed isolated coronary artery bypass graft (CABG) surgery during the same time period. Isolated CABG surgery means that no other major heart procedure such as valve repair was performed at the same time. In 2006, the statewide operative mortality rate was 2.22%, a 28% reduction from the 3.08% rate in 2005. For the 2005-2006 period, the statewide operative mortality rate was 2.65%, a 14% reduction compared to the 3.08% rate recorded for the 2003-2004 period. This reduction in mortality means that 379 fewer lives were lost in 2005-2006 compared to the 2003-2004 period. In this report, readers can also find 2006 hospital ratings for use of the internal mammary artery, an important evidence-based indicator of surgery quality.

This information is intended for cardiac patients and their families who are developing treatment plans with their doctors. It is also intended for hospitals and surgeons who are developing quality improvement activities and for organizations that purchase health coverage for their members. The clinical data collected and used to generate these findings are accurate and valid, and the analytical methods are rigorous. However, note that data after 2006 are not included, and surgeon or hospital practices may have changed since then.

We commend the hospitals and cardiac surgeons in California and the Clinical Advisory Panel that oversees the program for their hard work and dedication in completing this public report. The Office of Statewide Health Planning and Development continues to work with hospitals, physicians, and professional surgical societies to ensure that our reports are accurate, fair, and contribute to improved cardiac surgical care for all residents of the Golden State.



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EXECUTIVE SUMMARY

The California Coronary Artery Bypass Graft (CABG) Outcomes Reporting Program (CCORP) is the largest public reporting program on CABG surgery outcomes in the United States with 32,586 isolated CABG surgeries reported in 2005-2006.

The *California Report on Coronary Artery Bypass Graft Surgery, 2005-2006 Hospital and Surgeon Data* presents findings from analyses of data collected from California's 121 state-licensed hospitals where 284 surgeons performed adult isolated coronary artery bypass graft (CABG) surgery¹ during 2005 and 2006.

The report uses risk-adjusted operative mortality to evaluate hospital and surgeon performance. Risk adjustment is a statistical technique that allows for fair comparison of hospital or surgeon outcomes even though some hospitals and surgeons have sicker patients than average. Operative mortality includes all deaths that occur during the hospitalization in which the CABG surgery was performed (regardless of length of stay) and any deaths within 30 days after the surgery, no matter where the deaths occurred.

This report provides hospital-level information on internal mammary artery (IMA)² usage for 2006, an additional measure of surgical quality. This report also examines the relationship between the number of surgeries that hospitals and surgeons perform and their mortality rates.

Key findings from this report are:

- There were 347 operative deaths among 15,647 isolated CABG surgeries in 2006. The operative mortality rate for isolated CABG surgery in California was 2.22% for 2006, compared to 3.08% for 2005 (522 operative deaths among 16,939 isolated CABG surgeries). Nationally, the Society of Thoracic Surgeons (STS) reported an operative mortality rate of 2.4% for 2005 and 2.3% for 2006.³ STS hospital participation is voluntary and the group does not verify hospital reported deaths by linking with state vital statistics death files, as CCORP does.
- There was significant variation in hospital-level CABG surgery outcomes after adjusting for patients' pre-operative health conditions. Hospital risk-adjusted mortality rates in 2006 ranged from 0% to 10.38%. However, 114 of 121 hospitals (94.2%) performed at an expected rate when compared to the state's overall mortality rate.

¹ Isolated CABG surgery refers to heart bypass surgery without other major surgery, such as heart or lung transplantation, valve repair, etc., performed concurrently with the bypass procedure. See the CCORP Web site for a complete definition of isolated CABG. http://www.oshpd.ca.gov/HID/SubmitData/CCORP_CABG/index.html

² The internal mammary artery (IMA) is an artery that supplies blood to the front chest wall and the breasts. It is a paired artery, with one running on each side of the inner chest. Evidence shows that the IMA, when grafted to a coronary artery, is less susceptible to obstruction over time and remains fully open longer than vein grafts.

³ Society of Thoracic Surgeons: 2nd Harvest 2008 Adult Cardiac Surgery Database Executive Summary, 03/31/2008. <http://www.sts.org/sections/stsnationaldatabase/publications/executive/article.html>

- For 2006, 5 of the 121 hospitals performed significantly **“Better”** than the state average, and 2 hospitals performed significantly **“Worse”** than the state average. These hospitals are presented in the following table in alphabetical order:

Hospitals with “Better” Performance Ratings, 2006

Hospital	Region
Doctors Medical Center - Modesto Campus	Central California
Kaiser Foundation Hospital (Geary San Francisco)	San Francisco Bay Area & San Jose
Kaiser Foundation Hospital (Sunset)	Greater Los Angeles
Mercy General Hospital	Sacramento Valley & Northern California
Pomona Valley Hospital Medical Center	Inland Empire, Riverside & San Bernardino

Hospitals with “Worse” Performance Ratings, 2006

Hospital	Region
San Joaquin Community Hospital	Central California
Tri-City Medical Center	Greater San Diego

- Hospital risk-adjusted mortality rates and performance ratings were also produced for 2005-2006, the same period as the surgeon-level results, and are included later in this report.

- There was wide variation in surgeon-level CABG surgery outcomes after adjusting for patients' pre-operative health conditions. Surgeon overall risk-adjusted mortality rates in 2005-2006 ranged from 0% to 100% (one surgeon performed CABG on only one patient, who died), combined across all facilities where they operate. However, 275 of the 284 surgeons (96.8%) performed within the expected range compared to the state's average mortality rate.
- For 2005-2006, one surgeon's overall performance was significantly "**Better**" than the state average, and eight surgeons' overall performance was significantly "**Worse**" than the state average. These surgeons are presented in the following table in alphabetical order:

Surgeons with "Better" Performance Ratings Overall, 2005-2006

Surgeon	Region
Gharavi, Mohammad A.	San Fernando Valley, Antelope Valley, Ventura & Santa Barbara

Surgeons with "Worse" Performance Ratings Overall, 2005-2006

Surgeon	Region
Derrick, Marvin J.	Central California
Dhar, Naveen	Orange County
Eugene, John	Orange County and Greater Los Angeles
Gunupati, Venkata C.	Greater Los Angeles
Kriett, Jolene M.	Greater San Diego
Lee, Sang H.	San Francisco Bay Area & San Jose
Tobin, Hugh M.	Central California
Young, John A.	Greater San Diego

- Surgeon ratings are also provided separately for each hospital where they operated. These ratings take into consideration both surgeon and hospital-specific factors.

Other major findings in this report include:

- Internal Mammary Artery (IMA) usage is a nationally endorsed measure of quality for heart bypass surgery. Most patients are able to receive an IMA bypass. Very low hospital utilization rates may be associated with poorer care. Clinical research shows that IMA grafts used in CABG surgery stay open longer and increase patient survival. Since CCORP first reported IMA usage by hospitals for 2003-2004, the overall California IMA usage rate has increased from 89.6% to 93.3% in 2006. In 2003-2004, eight hospitals were noted as having significantly lower IMA usage rates. In 2006, only three hospitals had significantly lower IMA usage rates. These hospitals are presented in the following table in alphabetical order:

Hospitals with "Low" IMA Performance Ratings, 2006

Hospital	Region
Lancaster Community Hospital	San Fernando Valley, Antelope Valley, Ventura & Santa Barbara
Sutter Medical Center of Santa Rosa	San Francisco Bay Area & San Jose
USC University Hospital	Greater Los Angeles

- A small but significant association was found between a hospital's CABG surgery volume (both isolated and total CABG surgery) and isolated CABG surgery operative mortality. This association is primarily explained by the lower operative mortality rates among a few very high volume hospitals. Similarly, a small but significant association was found between a surgeon's CABG surgery volume (both isolated and total CABG surgery volume) and isolated CABG surgery operative mortality. This association is primarily explained by the higher operative mortality rates among lower volume (less than 50 cases per year) surgeons. Most studies have found that hospitals and surgeons that perform more CABG surgeries have better outcomes, but other research, along with some prior OSHPD studies, have not found evidence of such a relationship.
- In California, utilization of percutaneous coronary interventions (PCIs), such as angioplasty with stent insertion, increased by 22.4% from 1997 to 2007, peaking in 2005 when total PCI volume reached 60,709. During the same period, the number of isolated CABG surgeries dropped by 46.6%. The observed in-hospital mortality rate for isolated CABG surgeries decreased from 3.08% in 1997 to 1.90% in 2007 while the same mortality rate for PCIs generally remained stable (1.70% in 1997 and 1.75% in 2007). A more comprehensive approach to assessing the quality of revascularization procedures in California would include reporting the outcomes of PCI providers.

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Many people contributed to this report. Hospital staff dedicated time and resources to collect, report and review the data for analysis. Hospitals provided ongoing feedback on the design of the program, which was vital to its success. Members of the CCORP Clinical Advisory Panel also provided oversight and policy guidance in data collection and analysis, as well as presentation of results. The California Department of Public Health provided vital statistics files needed for identifying post-surgery deaths after discharge. CCORP also benefited from collaboration with the Society of Thoracic Surgeons and its California Chapter to coordinate and improve data collection efforts.

CCORP reflects the efforts and significant contributions of the following individuals:

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I. INTRODUCTION

This report is a public disclosure of the quality of care provided by hospitals and surgeons performing coronary artery bypass graft (CABG) surgery in California during 2005 and 2006. It is the fourth heart bypass surgery report developed by the Office of Statewide Health Planning and Development (OSHPD) in implementing California Health and Safety Code Sections 128745-128750. This 2005-2006 report covers all of California's 121 state licensed hospitals where this procedure is performed. It is the second report to detail results for all 284 responsible surgeons who performed the surgeries.⁴

This report uses risk-adjusted operative mortality as the outcome measure. Operative mortality is defined as patient death occurring in the hospital after CABG surgery, regardless of the length of stay, or death occurring anywhere after hospital discharge but within 30 days of the CABG surgery. Use of operative mortality as the outcome, instead of in-hospital mortality, avoids potential manipulation of outcomes through discharge practices and holds hospitals accountable for patients who died at home shortly after discharge or who were transferred and died in other facilities. The National Quality Forum (NQF), which serves as the national body for vetting quality measures, has endorsed the national Society of Thoracic Surgeons (STS) operative mortality measure for CABG surgery.⁵ STS uses operative mortality as its primary outcome measure for CABG surgery quality reporting, although they do not verify deaths following patient discharge as CCORP does.

In this report, the operative mortality rate is adjusted statistically to account for variation in the health condition of patients before CABG surgery. The report is intended to encourage hospitals and surgeons to examine their surgical practices and make changes to improve quality of care. Patients, their families, and healthcare purchasers may use this information when making decisions about CABG surgery.

OSHPD provided all hospitals listed in this report an opportunity to review their results prior to publication and to submit a comment letter for inclusion in this report. Five hospitals submitted letters, and they are included in Appendix A. These statements may help readers understand the concerns of some healthcare providers regarding the information released about them.

All surgeons listed in this report were also provided an opportunity to review their results. Surgeons who felt their risk-adjusted mortality results did not reflect the quality of care provided were allowed to submit a statement to OSHPD. OSHPD professional staff accepted or rejected the statements and surgeons who did not agree with OSHPD's determination were then able to forward their statement to the CCORP Clinical Advisory Panel (CAP)⁶ for review. Eleven surgeons submitted statements to OSHPD regarding their risk-adjusted results, and five were forwarded to the CAP. The CAP concurred with OSHPD's determination on all but one surgeon statement.⁷

⁴ The term "responsible surgeon" refers to the principal surgeon who performs the coronary artery bypass procedure. If a trainee performs this procedure, the responsible surgeon is the physician responsible for supervising the trainee. In situations where a responsible surgeon cannot otherwise be determined, the responsible surgeon is the surgeon who bills for the coronary artery bypass procedure.

⁵ National Quality Forum (NQF), National Voluntary Consensus Standards for Hospital Care: Additional Priority Areas, 2005-2006, Washington, DC: NQF; 2006.

⁶ The CCORP Clinical Advisory Panel (CAP) is established in California Health and Safety Code Section 128748. The panel is appointed by the OSHPD Director with nomination from various professional groups.

⁷ As a result of the surgeon statement process, some isolated CABG cases were removed from the results for surgeons and their associated hospitals, therefore table column totals may not equal the number of individual hospital/surgeon cases listed.

II. CORONARY ARTERY DISEASE AND BYPASS SURGERY

During 2005 and 2006, 214,516 Californians with coronary artery disease (CAD) were admitted to hospitals, which represented 7.8% of all adult non-maternal admissions. CAD was the leading cause of adult, non-maternal admissions.⁸

Coronary artery disease is a chronic condition in which cholesterol and fat solidify and form plaque along the linings of the coronary arteries. This process is called atherosclerosis or hardening of the arteries. If plaque continues to accumulate, blood vessels may become partially or completely blocked, so the heart does not receive enough oxygen, leading to angina (chest pain) or even myocardial infarction (heart attack).

The two most common procedures for the treatment of coronary artery disease are percutaneous coronary intervention (PCI), which includes drug-eluting stents, and CABG surgery. Despite recent increases in the number of PCI procedures performed, CABG surgery is more frequently recommended for patients with extensive coronary disease, reduced left ventricular function, and disease involving the major artery to the heart muscle (also known as “left main coronary artery”).

During CABG surgery, the surgeon uses arteries or veins from another part of the body (e.g., the internal mammary artery or the saphenous vein from the leg) to reroute blood around a blockage in the coronary arteries. This allows oxygen-rich blood to flow freely to nourish the heart muscle. Surgeons may create single or multiple grafts for patients, depending on how many blood vessels and main branches are blocked. In most patients, the preferred initial graft for CABG surgery is the internal mammary artery, since it maintains better blood flow over time and is associated with better long-term patient survival.

Study Population

Under State law, California-licensed hospitals are required to report all isolated and non-isolated CABG surgeries to CCORP. Isolated CABG surgery is defined as CABG surgery performed without other major heart procedures, such as valve repair, during the same surgery (CCORP definition of isolated CABG surgery can be found at http://www.oshpd.ca.gov/HID/SubmitData/CCORP_CABG/2006AbstractTrain.pdf).

In 2005 and 2006, there were 41,256 adult CABG surgeries performed in California; of these, 32,586 (79%) were isolated CABG surgeries and 8,670 (21%) were non-isolated CABG surgeries. The study population for this report consists of all adult patients who underwent isolated CABG surgery and were discharged in 2005 or 2006. Isolated CABG surgery cases were selected as the study population because the uniformity of the surgical process allows adequate pre-operative risk adjustment for patient conditions. Non-isolated CABG cases were not used to determine hospital and surgeon performance ratings in this report.

⁸ Data source: OSHPD, Patient Discharge Data, 2005 and 2006. Patients were identified with CAD if the principal diagnosis was coded as ICD-9-CM 410.0 - 414.9.

III. DATA

The primary data source for this report is the 2005 and 2006 clinical registry data collected by CCORP from reporting hospitals. These data were linked to death records from the California Department of Public Health to identify patients who died at home or at facilities other than the operating hospital within the 30 days following CABG surgery.

The CCORP clinical data registry draws on a subset of data elements collected by the Society of Thoracic Surgeons (STS) for their National Database of Cardiac Surgery. However, some data elements are exclusive to CCORP. Although the STS and CCORP data definitions are virtually identical, CCORP provides additional clarifications to assist hospitals with coding. The data elements collected by CCORP in 2005-2006 and their definitions can be found at the OSHPD Web site:
http://www.oshpd.ca.gov/HID/SubmitData/CCORP_CABG/index.html.

Data Quality Review and Verification

The data submitted by each hospital were reviewed for completeness and errors. A three-step data quality review and verification process including data quality reports, data discrepancy reports, and risk factor coding reports was followed by a hospital medical chart audit.

Step 1: Data Quality Reports

Data quality reports compare hospital-specific rates of occurrence for each preoperative risk factor to the state average. Hospitals are provided summary reports for review and data correction, which include checks for invalid, missing, and abnormally high or low risk factor values.

Step 2: Data Discrepancy Reports

Data discrepancy reports compare the CCORP data to another OSHPD data source, the Patient Discharge Data (PDD). Hospitals are then required to account for discrepancies between the two data sources via chart review, including cross checking at the patient level to verify that: 1) all CABG surgeries discharged in 2005 and 2006 were reported; 2) all *Isolated* CABG surgery in-hospital deaths were reported; 3) coding of *Discharge Status* was consistent; 4) coding of *Cardiogenic Shock* was consistent; and 5) coding of *Status of the Procedure* "Emergent/Salvage" was consistent.

Step 3: Risk Factor Coding Reports

Risk factor coding reports compare CCORP data to other years of data submitted for each hospital as well as to the PDD and audit findings. These reports take a variety of data sources into consideration in order to identify possible under-reporting and over-reporting of risk factors. Hospitals are provided a list of possibly miscoded data elements and asked to revise their coding.

Hospital Medical Chart Audit

A preliminary risk model was developed using 2005-2006 data that completed the three-step data quality review and verification processes to identify outlier hospitals (i.e., “Better” or “Worse” performers). The primary candidates for data audit were hospitals identified as preliminary outliers, near outliers, or those with problems in over-reporting or under-reporting risk factors. A small number of hospitals were also randomly selected for the on-site audit. The 2006 data audit included 36 hospitals and a total of 2,519 patient records (30% of all hospitals and 16% of all isolated CABG surgery cases in 2006). On-site medical chart reviews were conducted by trained, independent auditors under contract to OSHPD. All isolated CABG deaths at the selected hospitals were audited and high risk patients were sampled at a higher rate. The number of patient records selected within a hospital was proportional to the isolated CABG volume of the hospital, but generally fell within a range of 40 to 160 cases. If a selected hospital performed less than 40 isolated CABG surgeries per year, all surgeries were audited.

Key findings from the 2006 hospital medical chart audit include:

- The audit found that 99.2% of all reported isolated CABG cases were correctly coded as isolated. Auditors found 20 isolated CABG cases that should have been coded as non-isolated.
- The accuracy of hospital submitted data has improved each year since the program’s inception. In 2006, 9.2% of the comparisons between audited and CCORP categorical data elements resulted in a data correction, compared to 9.4% in 2005, 9.7% in 2004 and 11.2% in 2003.
- Over-coding of categorical risk factors (hospital coded risk factors as more severe than auditor) decreased from 4.1% in 2005 to 3.7% in 2006. Under-coding of categorical risk factors (hospital coded risk factors as less severe than auditor) decreased from 4.5% to 3.4% for the same time period.
- Among 40 audited categorical variables the percent agreement ranged from 66.1% to 100%. Thirty variables exceeded 90% agreement. However, percent agreement was low for *NYHA Class IV* (66.1%), *Mitral Insufficiency* (69.2%), *Myocardial Infarction Timing* (75.7%), *Status of Procedure* (77.8%), and *Chronic Lung Disease* (78.7%). The Kappa values for risk factors included in the logistic regression risk model ranged from 0.339 for *NYHA Class IV* to 0.991 for gender.

The audited data were incorporated into the CCORP data to develop the public report. An audit summary was sent to hospitals for review. All outlier hospitals identified in 2006 were audited except one, which had been audited in 2004. All outlier surgeons identified in the 2005-2006 report were audited except one. This surgeon performed only one isolated CABG surgery during the report period.

IV. 2005-2006 RISK MODEL FOR ADJUSTING HOSPITAL AND SURGEON OPERATIVE MORTALITY RATES

Whether patients recover quickly, have complications, or die following CABG surgery is in part a result of the medical care they receive. However, it is difficult to compare outcomes and assess surgical performance because patients treated at different hospitals or by different surgeons often vary in the severity of their pre-operative clinical conditions.

To make fair comparisons among different providers, it is necessary to adjust for the differences in the case mix of patients across providers. CCORP “levels the playing field” by considering the pre-operative condition of each patient. Providers that handled more complex cases received a larger risk-adjustment weight in the risk model, while providers that handled less complex cases received a smaller weight. Thus, hospitals and surgeons treating sicker patients were not at a disadvantage when their performance was compared with other hospitals and surgeons.

CCORP used a multivariable logistic regression model to determine the relationship between each of the demographic and pre-operative risk factors and the probability of operative mortality. Multivariable logistic regression models relate the probability of death to the risk factor (e.g., *Patient Age*) while controlling for all other risk factors in the model.

The risk model was developed in two steps. In the first step, the 32,586 isolated CABG surgery cases were evaluated for missing data (30,426 of these had no missing data in any field and were used for the risk model parameter estimation). The 2,160 (6.6%) isolated CABG cases with missing data fields were removed to ensure that the effects of risk factors were estimated based on the most complete data available. To generate the hospital and surgeon-specific results shown in this report, missing values for these 2,160 records were imputed (after risk model parameter estimation) by replacing them with the lowest risk category of the same variable (e.g., *Chronic Lung Disease=None*). CCORP assigned the lowest risk value based on the following rationale: 1) some hospitals may leave data fields blank by design when the risk factor is absent or the value is normal; 2) to maintain consistency with other major cardiac reporting programs that also replace missing data with the lowest-risk or normal value; and 3) assigning values for missing data in this way creates an incentive for more complete reporting by hospitals. After imputing the missing values, the parameters of the risk model were applied to all cases to estimate each patient’s probability of death. These probabilities were then summed to estimate the expected mortality for each hospital and surgeon. The risk model based on the 2005-2006 dataset is presented in Table 1.

GUIDE TO INTERPRETING THE 2005-2006 LOGISTIC REGRESSION RISK MODEL

Coefficient	The coefficient for each risk factor represents the effect that factor has on a patient's probability of dying (in the hospital or within 30 days) following bypass surgery. If the value is positive, it means that the characteristic is associated with an increased risk of death compared to not having the characteristic, while controlling for the effect of all other factors. If the coefficient is negative, having that characteristic is associated with a lower risk of death compared to not having it. The larger the value (whether positive or negative), the greater the effect or weight this characteristic has on the risk of dying. For example, the coefficient for "Congestive Heart Failure" in the 2005-2006 model is 0.269 and statistically significant at the $p < 0.05$ level. This value is positive, so it indicates that CABG patients with congestive heart failure are at an increased risk of dying compared to patients who do not have the disease.
Standard Error	The standard error is a measure of the variation or dispersion of the standard deviation of the sampling distribution of an estimate. It measures the statistical reliability of that estimate.
p-value	The p-value is a measure of the statistical significance of the coefficient estimate compared to a null value or reference category. Commonly, p-values of less than 0.05 are considered statistically significant. The smaller the p-value, the more likely the effect of a factor is real, rather than due to chance.
Significance	When the p-value of a coefficient is less than 0.05, it is deemed statistically significant at the 0.05 level and is denoted with one star (*) in the significance column. Two stars (**) indicate statistical significance at the 0.01 level and three stars (***) indicate statistical significance at the 0.001 level. All statistical tests are two-tailed tests.
Odds Ratio	An odds ratio is another way of characterizing the impact of each risk factor on operative mortality. Mathematically, the odds ratio is the antilogarithm of the coefficient value. The larger the odds ratio (above 1.0), the greater the impact that risk factor has on the risk of dying. An odds ratio of 1.0 means the factor has no effect. An odds ratio less than 1.0 means that the factor decreases the risk of dying. For example, the odds ratio for congestive heart failure (CHF) in the 2005-2006 model is 1.309. This means that for patients with CHF, the odds of dying are about 31% higher compared to patients without CHF, assuming all other risk factors are the same.

Table 1: Logistic Regression Risk Model for Operative Mortality, 2005-2006

Risk Factor		Coefficient	Standard Error	p-value	Significance	Odds Ratio
Intercept		-9.893	0.409	<.0001	***	
Age (by single year)		0.049	0.004	<.0001	***	1.050
Gender	Male	Reference				
	Female	0.417	0.082	<.0001	***	1.517
Race	White	Reference				
	Non-White	0.136	0.082	0.098		1.146
BMI	18.5-40.0	Reference				
	< 18.5	0.768	0.241	0.001	**	2.155
	> 40.0	0.597	0.183	0.001	**	1.816
Status of Procedure	Elective	Reference				
	Urgent	0.492	0.108	<.0001	***	1.636
	Emergent	0.960	0.181	<.0001	***	2.613
	Emergent/Salvage	2.598	0.428	<.0001	***	13.442
Creatinine PreOp (mg/dl)		1.264	0.118	<.0001	***	3.538
Hypertension		-0.050	0.110	0.652		0.952
Peripheral Vascular Disease		0.420	0.090	<.0001	***	1.522
Cerebrovascular Disease		0.131	0.095	0.166		1.140
Diabetes		-0.011	0.081	0.893		0.989
Chronic Lung Disease	None, Mild	Reference				
	Moderate	0.288	0.136	0.034	*	1.333
	Severe	0.520	0.137	<.0001	***	1.682
Immunosuppressive Treatment		0.574	0.175	0.001	**	1.775
Arrhythmia Type	None	Reference				
	Atrial Fibrillation/Flutter	0.527	0.115	<.0001	***	1.693
	Heart Block	0.358	0.235	0.127		1.430
	Sustained VT/VF	0.433	0.178	0.015	*	1.542
	None	Reference				
Myocardial Infarction	21+ days ago	0.280	0.114	0.014	*	1.323
	8-21 days ago	0.351	0.159	0.027	*	1.420
	1-7 days ago	0.281	0.104	0.007	**	1.325
	Within 24 Hours	0.669	0.164	<.0001	***	1.952
	None	Reference				
Cardiogenic Shock		0.599	0.172	0.001	**	1.821
Congestive Heart Failure		0.269	0.092	0.003	**	1.309
NYHA Classification	I, II, III	Reference				
	IV	0.317	0.086	<0.0001	***	1.374
Previous Operations	None	Reference				
	One or More	0.867	0.132	<.0001	***	2.380
Prior PCI Interval	No Prior PCI	Reference				
	> 6 Hours	0.088	0.100	0.376		1.092
	<= 6 Hours	0.461	0.255	0.071		1.585
Ejection Fraction (%)		-0.012	0.003	<.0001	***	0.988
Left Main Disease % Stenosis		0.002	0.002	0.506		1.002
Number of Diseased Vessels	None, One, or Two	Reference				
	3 or more	0.388	0.108	<0.0001	***	1.474
Mitral Insufficiency	None, Trivial, Mild	Reference				
	Moderate	0.375	0.128	0.004	**	1.455
	Severe	0.710	0.280	0.011	*	2.035

Notes: Creatinine PreOp, Ejection Fraction, and Left Main Disease % Stenosis were all modeled using piecewise linear transformations.

* significant at the 0.05 level (two-tailed test)

** significant at the 0.01 level (two-tailed test)

*** significant at the 0.001 level (two-tailed test)

Discrimination

Models that distinguish well between patients who die and those who survive are said to have good discrimination. A commonly used measure of discrimination is the C-statistic [also known as the area under the Receiver Operating Characteristic (ROC) curve]. For all possible pairs of patients, where one dies and the other survives surgery, the C-statistic describes the proportion of pairs where the patient who died had a higher predicted risk of death than the patient who lived. The C-statistic ranges from 0.5 to 1, with higher values indicating better discrimination. For the 2005-2006 risk model, the C-statistic was 0.814. In recently published studies of CABG surgery operative mortality using logistic regression models (including those from New Jersey, New York and Pennsylvania), the C-statistic ranged from 0.798 to 0.815. In comparison, the CCORP 2005-2006 risk model compares favorably with other programs that produce risk-adjusted outcomes data for isolated CABG surgery.

Calibration

Calibration refers to the ability of a model to match predicted and observed mortality across the entire spectrum of the data. A model in which the number of observed deaths matches closely with the number of deaths predicted by the model demonstrates good calibration. Good calibration is essential for accurate risk adjustment. A common measure of calibration is the Hosmer-Lemeshow χ^2 test, which compares observed and predicted outcomes over deciles of risk. The p-value of the Hosmer-Lemeshow test statistic for the risk model is 0.269, indicating a nonsignificant likelihood of poor calibration. That is, the predicted mortality was consistent with actual mortality in the data.

Another way to test model calibration is to partition the data and compare observed events (death) with predicted events (death) in each of 10 risk groups. The 10 risk groups are created by sorting all observations by the predicted risk of death and then dividing the sorted observations into deciles of approximately equal size. As presented in Table 2, the first row shows the patients in the lowest risk group (i.e., their mean predicted mortality was less than 0.3%). Among the 3,042 patients in this group, 7 patients died, but the model predicted 8.9 patient deaths. Assuming a Poisson distribution for a binary outcome, the predicted range of deaths for this group is 3.1 to 14.8. The observed number of 7 deaths falls within the range of expected deaths. In fact, only one of ten risk groups has either significantly fewer or significantly more deaths than were predicted by the model. Overall the risk model shows no systematic underestimation or overestimation of mortality at the extremes.

Table 2: Calibration of 2005-2006 Risk Model

Risk Group	Predicted Mortality	Isolated CABG cases	Observed Deaths	Predicted Deaths	Difference	95% CI of predicted deaths
1	0.0029	3,042	7	8.9	1.9	(3.1, 14.8)
2	0.0049	3,043	16	14.8	-1.2	(7.3, 22.4)
3	0.0067	3,046	15	20.4	5.4	(11.6, 29.3)
4	0.0088	3,044	21	26.7	5.7	(16.6, 36.8)
5	0.0113	3,044	23	34.5	11.5	(23.0, 46.0)
6	0.0147	3,043	43	44.9	1.9	(31.7, 58.0)
7	0.0195	3,043	64	59.4	-4.6	(44.3, 74.5)
8	0.0273	3,044	78	83.2	5.2	(65.3, 101.0)
9	0.0433	3,043	166	131.8	-34.2	(109.3, 154.3)
10	0.1250	3,034	371	379.4	8.4	(341.2, 417.6)
Total		30,426	804	804	0	

V. RISK-ADJUSTED OPERATIVE MORTALITY RESULTS AND HOSPITAL AND SURGEON PERFORMANCE RATINGS

The risk-adjusted mortality rate (RAMR) represents the best estimate of what a provider's mortality rate would have been if the provider had a patient case mix identical to the statewide mix. Thus, this rate is comparable among providers since the differences in patient severity of illness have been accounted for. The RAMR is computed, first by dividing the provider's observed mortality by the provider's expected mortality rate based on the risk model to get the observed/expected (O/E) ratio. If the O/E ratio is greater than one, the provider has a higher mortality than expected based on patient mix. If the O/E ratio is less than one, the provider has a lower mortality rate than expected. The O/E ratio is then multiplied by the overall state mortality rate (2.22% for 2006 alone; 2.65% for 2005-2006 combined) to obtain the provider's risk-adjusted mortality rate.

To minimize the risk of misinterpretation of differences caused by chance variation, the performance rating is based on a comparison of the 95% confidence interval (CI) of each provider's RAMR to the California state average mortality rate.⁹ This was done because a provider's point estimate of the RAMR based on a small number of cases may be attributed to chance. Thus, OSHPD treated 2005-2006 data as a sample, from which it inferred the range within which each provider's true performance was likely to fall. As shown in Tables 3, 4 and 5, if the entire 95% CI of a provider's risk-adjusted mortality is below the state average mortality rate, indicating the provider's RAMR is significantly lower than the state average, the performance rating is "**Better**"; if the entire 95% CI of a provider's RAMR is above the state average mortality rate, indicating the provider's risk-adjusted mortality is significantly higher than the state average, the performance rating is "**Worse**"; if the state average mortality rate is within the 95% CI of a provider's RAMR, the performance rating is "**Not Different**" and left blank.

⁹ The Poisson exact probability method was used for computation of 95% confidence interval for the risk-adjusted mortality rate. (Buchan Iain, *Calculating Poisson Confidence Interval in Excel*, January 2004)

GUIDE TO INTERPRETING TABLES 3, 4 and 5	
All CABG Cases	The total number of isolated and non-isolated CABG cases submitted to CCORP for the time period indicated (i.e., 2006 alone or 2005-2006 combined). Non-isolated CABG cases are not used in calculating performance ratings.
Isolated CABG Cases	The number of isolated CABG cases submitted to CCORP during the time period indicated. Only isolated CABG cases are used in calculating performance ratings.
Isolated CABG Deaths	The actual number of operative deaths for isolated CABG cases for the time period indicated. The number of deaths includes: (1) all deaths that occur during the hospitalization in which the CABG surgery was performed, regardless of length of stay, and (2) all deaths occurring anywhere after hospital discharge, but within 30 days of the CABG surgery.
Observed Mortality Rate	The ratio of the number of isolated CABG deaths and the isolated CABG cases multiplied by 100: Observed Mortality Rate = Number of Isolated CABG Deaths/Isolated CABG Cases X 100.
Expected Mortality Rate	The ratio of the expected number of operative deaths predicted for a provider (after adjusting for its patient population) and the number of Isolated CABG cases multiplied by 100: Expected Mortality Rate = Number of Expected Deaths/Number of Isolated CABG Cases X 100.
Risk-Adjusted Mortality Rate (RAMR) and 95% Confidence Interval (CI)	The Risk-Adjusted Mortality Rate (RAMR) is obtained by multiplying the observed overall California mortality rate (CAMR) by a hospital's Observed Mortality Rate/Expected Mortality Rate (O/E ratio): (CAMR X O/E ratio). The 95% confidence interval (CI) represents the confidence we have in the estimate for the RAMR. The CI is calculated using exact Poisson 95% CI calculations.
Performance Rating	The performance rating is based on a comparison of the 95% CI of each provider's risk-adjusted mortality rate and the California observed mortality rate. This is a test of statistical significance. A hospital or surgeon is classified as "Better" if the entire 95% CI of the RAMR falls below the California observed mortality rate (2.22% for 2006; 2.65% for 2005-2006). A hospital or surgeon is classified as "Worse" if the entire 95% CI of the RAMR is higher than the California observed mortality rate. A hospital or surgeon is classified as "Not Different" (performance rating is blank) if the California mortality rate falls within the CI of the hospital's risk-adjusted mortality rate.

2006 Hospital Risk-Adjusted Operative Mortality Results

Table 3 presents the risk-adjusted results for each hospital for 2006. The table is sorted by geographic region and contains, for each hospital, the total number of CABG surgeries performed (isolated and non-isolated combined), the number of isolated CABG surgeries, the number of observed isolated CABG deaths, the observed mortality rate, the expected mortality rate predicted by the risk model, the risk-adjusted mortality rate and the 95% CI of the RAMR, and the associated hospital performance rating.

Among the 15,647 isolated CABG surgeries performed in 2006, 347 patients died either in-hospital or within 30 days of the surgery date, reflecting an overall operative mortality rate of 2.22%. The observed mortality rates among hospitals ranged from 0% to 50% (two patients operated on, one who died). The expected mortality rates, which are generated by the model and measure patient severity of illness, were between 1.32% and 48.42%. The risk-adjusted mortality rates, which measure hospital performance, ranged from 0% to 10.38%.

Based on the 95% confidence intervals for risk-adjusted mortality rates, 114 of 121 hospitals (94%) performed within the expected range compared to the state's overall mortality rate (denoted by a blank space in the performance rating column of Table 3), 5 hospitals performed significantly **"Better"** than the state average, and 2 hospitals performed significantly **"Worse"** than the state average. Hospitals marked with two asterisks (**) in Table 3 submitted statements regarding this report. Those letters are presented in Appendix A.

Table 3: Hospital Risk-Adjusted Operative Mortality Results by Region, 2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		19,914	15,647	347	2.22				
Sacramento Valley & Northern California Region	Enloe Medical Center	233	173	5	2.89	3.72	1.72	(0.56, 4.02)	
	Mercy General Hospital	932	628	4	0.64	1.70	0.83	(0.23, 2.12)	Better
	Mercy Medical Center - Redding	206	171	5	2.92	3.54	1.83	(0.59, 4.28)	
	Mercy San Juan Hospital	112	79	1	1.27	2.08	1.35	(0.03, 7.53)	
	Rideout Memorial Hospital	165	116	3	2.59	3.23	1.78	(0.37, 5.20)	
	Shasta Regional Medical Center	89	78	2	2.56	3.18	1.79	(0.22, 6.46)	
	St. Joseph Hospital - Eureka	57	49	1	2.04	1.57	2.89	(0.07, 16.11)	
	Sutter Memorial Hospital	468	338	7	2.07	2.61	1.76	(0.71, 3.63)	
UC Davis Medical Center	196	125	1	0.80	2.07	0.86	(0.02, 4.77)		
San Francisco Bay Area & San Jose	Alta Bates Summit Medical Center - Summit Campus	766	604	13	2.15	2.35	2.03	(1.08, 3.47)	
	California Pacific Medical Center - Pacific Campus	112	85	3	3.53	2.52	3.11	(0.64, 9.08)	
	Doctors Medical Center - San Pablo Campus	19	17	1	5.88	2.55	5.11	(0.13, 28.51)	
	Dominican Hospital	96	80	1	1.25	2.71	1.02	(0.03, 5.71)	
	El Camino Hospital	83	59	0	0.00	1.61	0.00	(0.00, 8.62)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.22). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

Table 3: Hospital Risk-Adjusted Operative Mortality Results by Region, 2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		19,914	15,647	347	2.22				
	Good Samaritan Hospital - San Jose	183	144	4	2.78	3.13	1.97	(0.54, 5.04)	
	John Muir Medical Center - Concord Campus	239	200	4	2.00	2.12	2.09	(0.57, 5.35)	
	John Muir Medical Center - Walnut Creek Campus	2	2	1	50.00	48.42	2.29	(0.06, 12.77)	
	Kaiser Foundation Hospital (Geary San Francisco)	677	501	3	0.60	1.88	0.71	(0.15, 2.06)	Better
	Marin General Hospital	70	57	1	1.75	2.79	1.39	(0.04, 7.76)	
	O'Connor Hospital	86	72	1	1.39	2.00	1.54	(0.04, 8.59)	
	Peninsula Medical Center	27	20	0	0.00	3.06	0.00	(0.00, 13.39)	
	Queen of the Valley Hospital	250	219	7	3.20	3.46	2.05	(0.82, 4.22)	
	Regional Medical of San Jose	18	17	0	0.00	2.43	0.00	(0.00, 19.81)	
	Salinas Valley Memorial Hospital	141	109	2	1.83	2.17	1.87	(0.23, 6.78)	
	San Ramon Regional Medical Center	70	59	0	0.00	1.98	0.00	(0.00, 7.00)	
	Santa Clara Valley Medical Center	49	44	1	2.27	1.78	2.84	(0.07, 15.82)	
	Santa Rosa Memorial Hospital	61	47	0	0.00	1.96	0.00	(0.00, 8.91)	
	Sequoia Hospital	292	167	2	1.20	2.15	1.24	(0.15, 4.47)	

*A hospital is classified as “Better” if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.22). A hospital is classified as “Worse” if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital’s performance is considered “Not Different” from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

Table 3: Hospital Risk-Adjusted Operative Mortality Results by Region, 2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		19,914	15,647	347	2.22				
	Seton Medical Center	242	212	6	2.83	2.78	2.26	(0.83, 4.92)	
	St. Helena Hospital	100	91	4	4.40	3.46	2.81	(0.77, 7.21)	
	St. Mary's Medical Center, San Francisco	41	31	2	6.45	3.56	4.02	(0.49, 14.52)	
	Stanford University Hospital	193	131	2	1.53	2.53	1.34	(0.16, 4.84)	
	Sutter Medical Center of Santa Rosa	143	100	2	2.00	2.02	2.20	(0.27, 7.95)	
	UCSF Medical Center	156	132	2	1.52	2.61	1.29	(0.16, 4.65)	
	Valleycare Medical Center	17	15	1	6.67	9.01	1.64	(0.04, 9.15)	
	Washington Hospital – Fremont**	139	115	5	4.35	2.06	4.68	(1.52, 10.93)	
Central California									
	Bakersfield Heart Hospital	221	179	7	3.91	2.09	4.14	(1.67, 8.54)	
	Bakersfield Memorial Hospital	167	140	3	2.14	1.61	2.95	(0.61, 8.62)	
	Community Medical Center - Fresno	174	146	4	2.74	4.04	1.50	(0.41, 3.86)	
	Dameron Hospital	39	35	2	5.71	1.76	7.20	(0.87, 26.03)	
	Doctors Medical Center - Modesto Campus	363	292	1	0.34	2.12	0.36	(0.01, 2.00)	Better
	Fresno Heart Hospital	209	163	3	1.84	2.14	1.90	(0.39, 5.57)	

*A hospital is classified as “Better” if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.22). A hospital is classified as “Worse” if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital’s performance is considered “Not Different” from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

** Appendix A includes this hospital’s statement regarding the report.

Table 3: Hospital Risk-Adjusted Operative Mortality Results by Region, 2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% RAMR)	95% CI for RAMR	Performance Rating*
State of California		19,914	15,647	347	2.22				
	Kaweah Delta Hospital	283	240	6	2.50	2.56	2.16	(0.80, 4.72)	
	Marian Medical Center	109	93	4	4.30	2.98	3.20	(0.87, 8.19)	
	Memorial Medical Center of Modesto	316	253	9	3.56	2.63	3.00	(1.37, 5.70)	
	San Joaquin Community Hospital	71	67	5	7.46	2.10	7.87	(2.56, 18.38)	Worse
	St. Agnes Medical Center	396	345	5	1.45	2.15	1.50	(0.49, 3.50)	
	St. Joseph's Medical Center of Stockton	245	211	9	4.27	2.49	3.81	(1.74, 7.23)	
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara	Antelope Valley Hospital Medical Center	46	41	1	2.44	1.32	4.09	(0.10, 22.83)	
	Community Memorial Hospital of San Buenaventura	119	100	1	1.00	3.36	0.66	(0.02, 3.68)	
	Encino Tarzana Regional Medical Center - Tarzana	111	90	1	1.11	2.48	0.99	(0.03, 5.54)	
	French Hospital Medical Center	125	87	1	1.15	1.78	1.43	(0.04, 7.98)	
	Glendale Adventist Medical Center - Wilson Terrace	141	122	2	1.64	2.40	1.51	(0.18, 5.47)	
	Glendale Memorial Hospital and Health Center	146	120	1	0.83	3.00	0.62	(0.02, 3.43)	
	Lancaster Community Hospital	6	6	0	0.00	2.93	0.00	(0.00, 46.59)	
	Los Robles Regional Medical Center	130	101	1	0.99	3.88	0.57	(0.01, 3.16)	

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State of California		19,914	15,647	347	2.22				
	Northridge Hospital Medical Center	118	91	5	5.49	3.68	3.31	(1.08, 7.74)	
	Providence Holy Cross Medical Center	101	78	1	1.28	2.60	1.09	(0.03, 6.10)	
	Providence St. Joseph Medical Center	59	42	0	0.00	1.85	0.00	(0.00, 10.55)	
	Santa Barbara Cottage Hospital	214	155	4	2.58	3.53	1.62	(0.44, 4.16)	
	Sierra Vista Regional Medical Center	36	28	3	10.71	6.57	3.62	(0.75, 10.58)	
	St. John's Regional Medical Center	134	106	2	1.89	4.14	1.01	(0.12, 3.66)	
	Valley Presbyterian Hospital	34	32	2	6.25	1.33	10.38	(1.26, 37.55)	
	West Hills Regional Medical Center	50	44	2	4.55	3.01	3.35	(0.41, 12.11)	
Greater Los Angeles									
	Beverly Hospital	28	26	1	3.85	2.53	3.37	(0.09, 18.80)	
	Brotman Medical Center	5	4	0	0.00	4.78	0.00	(0.00, 42.79)	
	Cedars Sinai Medical Center	256	162	5	3.09	2.42	2.83	(0.92, 6.62)	
	Centinela Hospital Medical Center	97	82	1	1.22	2.42	1.12	(0.03, 6.23)	
	Citrus Valley Medical Center – IC Campus	87	64	1	1.56	3.12	1.11	(0.03, 6.19)	
	Downey Regional Medical Center	92	83	3	3.61	1.87	4.28	(0.88, 12.52)	

*A hospital is classified as “Better” if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.22). A hospital is classified as “Worse” if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital’s performance is considered “Not Different” from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

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Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		19,914	15,647	347	2.22				
	Garfield Medical Center	124	94	1	1.06	3.78	0.62	(0.02, 3.48)	
	Good Samaritan Hospital - Los Angeles	181	149	5	3.36	4.55	1.63	(0.53, 3.82)	
	Huntington Memorial Hospital	116	87	0	0.00	3.46	0.00	(0.00, 2.72)	
	Kaiser Foundation Hospital (Sunset)	994	819	12	1.47	2.59	1.25	(0.65, 2.19)	Better
	Lakewood Regional Medical Center	104	90	4	4.44	2.47	3.99	(1.09, 10.22)	
	Little Company of Mary Hospital	68	47	3	6.38	3.48	4.07	(0.84, 11.90)	
	Long Beach Memorial Medical Center	313	261	10	3.83	1.96	4.34	(2.08, 7.99)	
	Los Angeles Co. Harbor - UCLA Medical Center	109	98	4	4.08	2.35	3.85	(1.05, 9.86)	
	Los Angeles Co. USC Medical Center**	97	78	1	1.28	1.36	2.09	(0.05, 11.67)	
	Methodist Hospital of Southern California	98	84	0	0.00	2.27	0.00	(0.00, 4.30)	
	Presbyterian Intercommunity Hospital	128	103	0	0.00	2.95	0.00	(0.00, 2.69)	
	Santa Monica - UCLA Medical Center	27	19	0	0.00	1.82	0.00	(0.00, 23.69)	
	St. Francis Medical Center	48	46	1	2.17	2.36	2.04	(0.05, 11.41)	
	St. John's Hospital and Health Center	112	86	2	2.33	2.66	1.94	(0.24, 7.01)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.22). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

** Appendix A includes this hospital's statement regarding the report.

Table 3: Hospital Risk-Adjusted Operative Mortality Results by Region, 2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		19,914	15,647	347	2.22				
	St. Mary Medical Center	64	56	0	0.00	5.11	0.00	(0.00, 2.86)	
	St. Vincent Medical Center	130	116	2	1.72	3.22	1.19	(0.14, 4.29)	
	Torrance Memorial Medical Center**	140	81	2	2.47	2.28	2.40	(0.29, 8.67)	
	UCLA Medical Center	147	72	1	1.39	2.94	1.05	(0.03, 5.85)	
	USC University Hospital**	163	89	0	0.00	2.65	0.00	(0.00, 3.47)	
	White Memorial Medical Center	84	78	1	1.28	2.86	1.00	(0.03, 5.55)	
Inland Empire, Riverside & San Bernardino	Desert Regional Medical Center	197	166	7	4.22	3.26	2.86	(1.15, 5.91)	
	Eisenhower Memorial Hospital	269	212	7	3.30	2.72	2.69	(1.08, 5.54)	
	Loma Linda University Medical Center	373	286	6	2.10	2.62	1.78	(0.65, 3.87)	
	Pomona Valley Hospital Medical Center	195	184	1	0.54	3.14	0.38	(0.01, 2.14)	Better
	Riverside Community Hospital	207	180	4	2.22	3.01	1.64	(0.45, 4.19)	
	San Antonio Community Hospital	146	130	6	4.62	4.09	2.50	(0.92, 5.45)	
	St. Bernardine Medical Center	476	414	10	2.42	2.57	2.08	(1.00, 3.83)	
	St. Mary Regional Medical Center	185	151	8	5.30	4.01	2.93	(1.27, 5.78)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.22). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

** Appendix A includes this hospital's statement regarding the report.

Table 3: Hospital Risk-Adjusted Operative Mortality Results by Region, 2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		19,914	15,647	347	2.22				
Orange County	Anaheim Memorial Medical Center	208	188	4	2.13	2.87	1.64	(0.45, 4.21)	
	Fountain Valley Regional Hospital	98	91	3	3.30	3.70	1.98	(0.41, 5.78)	
	Hoag Memorial Hospital Presbyterian	237	151	1	0.66	2.03	0.72	(0.02, 4.04)	
	Irvine Regional Hospital and Medical Center	33	28	0	0.00	2.32	0.00	(0.00, 12.59)	
	Mission Hospital Regional Medical Center	157	140	2	1.43	2.42	1.31	(0.16, 4.74)	
	Saddleback Memorial Medical Center	142	117	2	1.71	1.83	2.07	(0.25, 7.48)	
	St. Joseph Hospital - Orange	161	115	3	2.61	1.87	3.09	(0.64, 9.05)	
	St. Jude Medical Center	173	143	3	2.10	1.74	2.68	(0.55, 7.83)	
	UC Irvine Medical Center	62	53	0	0.00	3.85	0.00	(0.00, 4.01)	
	West Anaheim Medical Center	42	38	2	5.26	3.90	2.99	(0.36, 10.83)	
	Western Medical Center - Santa Ana	76	59	1	1.69	2.92	1.29	(0.03, 7.17)	
Western Medical Center Hospital - Anaheim	98	89	5	5.62	2.65	4.69	(1.53, 10.96)		
Greater San Diego	Alvarado Hospital Medical Center	77	65	3	4.62	2.56	4.00	(0.83, 11.71)	
	Palomar Medical Center	100	76	1	1.32	1.44	2.03	(0.05, 11.33)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.22). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

Table 3: Hospital Risk-Adjusted Operative Mortality Results by Region, 2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		19,914	15,647	347	2.22				
	Scripps Green Hospital	130	96	0	0.00	2.17	0.00	(0.00, 3.93)	
	Scripps Memorial Hospital - La Jolla	400	303	6	1.98	3.60	1.22	(0.45, 2.66)	
	Scripps Mercy Hospital	152	124	6	4.84	2.81	3.81	(1.40, 8.31)	
	Sharp Chula Vista Medical Center	199	155	3	1.94	2.99	1.43	(0.30, 4.20)	
	Sharp Grossmont Hospital	145	117	2	1.71	3.64	1.04	(0.13, 3.76)	
	Sharp Memorial Hospital	232	132	1	0.76	1.66	1.01	(0.03, 5.65)	
	Tri-City Medical Center**	110	87	6	6.90	1.93	7.91	(2.91, 17.24)	Worse
	UCSD Medical Center	45	39	1	2.56	1.73	3.28	(0.08, 18.29)	
	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	84	49	0	0.00	1.85	0.00	(0.00, 9.01)	

*A hospital is classified as “Better” if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.22). A hospital is classified as “Worse” if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital’s performance is considered “Not Different” from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

** Appendix A includes this hospital’s statement regarding the report.

2005-2006 Surgeon Risk-Adjusted Operative Mortality Results

Table 4 presents the risk-adjusted results for each responsible surgeon for 2005-2006, both for the surgeon overall (i.e., across all hospitals where the surgeon operated) and for each hospital where the surgeon performed CABG surgery. Included are the total number of CABG surgeries performed (isolated and non-isolated combined), the number of isolated CABG surgeries, the number of isolated CABG deaths, the observed mortality rate, the expected mortality rate predicted by the risk model, the risk-adjusted mortality rate (RAMR), the 95% CI of the RAMR, and the associated surgeon performance rating.

Among the 32,586 isolated CABG surgeries performed in 2005 and 2006, 865 patients died in-hospital or within 30 days of the surgery date, reflecting an overall operative mortality rate of 2.65% in California. Surgeon overall observed operative mortality rates ranged from 0% to 100%. The surgeon overall expected mortality rate, which measures patient severity of illness, ranged from 0.50% to 24%. The surgeon overall risk-adjusted mortality rate, which measures surgeon performance, ranged from 0% to 100%.

For overall surgeon performance, 275 of 284 surgeons (97%) performed within the expected range (performance rating is blank), one surgeon performed significantly “**Better**” than the state average, and eight surgeons performed “**Worse**” than the state average.

Many surgeons perform surgery at multiple hospital sites. For surgeon-by-hospital results, 97% performed within the expected range (performance rating is blank), no surgeon at a hospital performed significantly “**Better**” than the state average, and 19 surgeons at a hospital performed “**Worse**” than the state average. Surgeons who performed only non-isolated CABG surgeries are included in Table 4, but no rates have been calculated and the performance rating is noted as “**Not Applicable**”.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Abolhoda, Amir M.	Surgeon Overall	58	50	1	2.00	2.94	1.81	(0.05, 10.06)	
	UC Irvine Medical Center	58	50	1	2.00	2.94	1.81	(0.05, 10.06)	
Abraham, Reginald G.	Surgeon Overall	56	51	3	5.88	3.95	3.95	(0.81, 11.53)	
	Fountain Valley Regional Hospital	54	49	3	6.12	4.07	4.00	(0.82, 11.66)	
	Kaiser Foundation Hospital (Sunset)	2	2	0	0.00	1.15	0.00	(0.00, 100.0)	
Adams, Carl W.	Surgeon Overall	6	5	2	40.00	4.91	21.63	(2.62, 78.00)	
	Mercy Medical Center - Redding	1	1	0	0.00	1.24	0.00	(0.00, 100.0)	
	St. Joseph Hospital - Eureka	5	4	2	50.00	5.83	22.78	(2.75, 82.16)	Worse
Adamson, Robert M.	Surgeon Overall	148	101	3	2.97	1.48	5.31	(1.09, 15.49)	
	Sharp Memorial Hospital	148	101	3	2.97	1.48	5.31	(1.09, 15.49)	
Afifi, Alaa Y.	Surgeon Overall	121	117	4	3.42	2.79	3.25	(0.88, 8.31)	
	Fountain Valley Regional Hospital	8	7	0	0.00	4.70	0.00	(0.00, 29.70)	
	Saddleback Memorial Medical Center	1	1	0	0.00	1.04	0.00	(0.00, 100.0)	
	St. Jude Medical Center	28	26	4	15.38	2.89	14.11	(3.84, 36.06)	Worse
	West Anaheim Medical Center	2	2	0	0.00	1.56	0.00	(0.00, 100.0)	
	Western Medical Center - Santa Ana	9	8	0	0.00	3.73	0.00	(0.00, 32.72)	
	Western Medical Center Hospital - Anaheim	73	73	0	0.00	2.52	0.00	(0.00, 5.31)	
Alyono, David	Surgeon Overall	314	251	5	1.99	2.19	2.41	(0.78, 5.63)	
	Alta Bates Summit Medical Center - Summit Campus	314	251	5	1.99	2.19	2.41	(0.78, 5.63)	
Amirhamzeh, Mehrdad M.	Surgeon Overall	229	196	5	2.55	2.13	3.18	(1.03, 7.41)	
	Doctors Medical Center - Modesto Campus	12	11	0	0.00	1.60	0.00	(0.00, 55.67)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement review process these cases were removed, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Amirhamzeh, Mehrdad M.	Memorial Medical Center of Modesto	217	185	5	2.70	2.16	3.32	(1.08, 7.74)	
Anastassiou, Peter T.	Surgeon Overall	73	58	4	6.90	3.00	6.11	(1.66, 15.61)	
	California Pacific Medical Center - Pacific Campus	16	14	1	7.14	1.20	15.77	(0.40, 87.70)	
	Dominican Hospital	1	1	0	0.00	0.74	0.00	(0.00, 100.0)	
	Peninsula Medical Center	10	5	0	0.00	4.02	0.00	(0.00, 48.59)	
	Seton Medical Center	11	9	1	11.11	2.02	14.61	(0.37, 81.28)	
	Sutter Medical Center of Santa Rosa	35	29	2	6.90	4.07	4.50	(0.54, 16.23)	
Arcidi, Joseph M.	Surgeon Overall	233	176	3	1.70	4.56	0.99	(0.20, 2.90)	
	Good Samaritan Hospital - Los Angeles	230	173	3	1.73	4.60	1.00	(0.21, 2.92)	
	Kaiser Foundation Hospital (Sunset)	3	3	0	0.00	1.85	0.00	(0.00, 100.0)	
Ardehali, Abbas	Surgeon Overall	83	42	0	0.00	2.47	0.00	(0.00, 9.41)	
	Santa Monica - UCLA Medical Center	30	23	0	0.00	1.87	0.00	(0.00, 22.68)	
	UCLA Medical Center	53	19	0	0.00	3.20	0.00	(0.00, 16.08)	
Atiya, Azmi W.	Surgeon Overall	174	145	7	4.83	3.79	3.38	(1.36, 6.95)	
	Encino Tarzana Regional Medical Center - Tarzana	2	0	.	.	.	.		Not Applicable
	Northridge Hospital Medical Center	103	85	6	7.06	4.71	3.98	(1.46, 8.65)	
	Providence Holy Cross Medical Center	63	55	0	0.00	2.28	0.00	(0.00, 7.81)	
	West Hills Regional Medical Center	6	5	1	20.00	4.89	10.85	(0.27, 60.35)	
Baker, Craig J.	Surgeon Overall	22	17	0	0.00	1.00	0.00	(0.00, 57.72)	
	Los Angeles Co. USC Medical Center	15	13	0	0.00	0.85	0.00	(0.00, 88.96)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Baker, Craig J.	USC University Hospital	7	4	0	0.00	1.49	0.00	(0.00, 100.0)	
Baladi, Naoum	Surgeon Overall	221	183	1	0.55	2.33	0.62	(0.02, 3.46)	
	Seton Medical Center	198	167	1	0.60	2.38	0.67	(0.02, 3.71)	
	St. Mary's Medical Center, San Francisco	23	16	0	0.00	1.76	0.00	(0.00, 34.62)	
Baradaran, Sam	Surgeon Overall	87	62	1	1.61	1.96	2.18	(0.06, 12.13)	
	Sharp Memorial Hospital	87	62	1	1.61	1.96	2.18	(0.06, 12.13)	
Baumgartner, Fritz J.	Surgeon Overall	11	8	1	12.50	2.51	13.24	(0.33, 73.62)	
	Lakewood Regional Medical Center	1	1	0	0.00	0.25	0.00	(0.00, 100.0)	
	Mercy Medical Center - Redding	10	7	1	14.29	2.83	13.41	(0.34, 74.56)	
Becker, Ronald M.	Surgeon Overall	48	44	2	4.55	2.88	4.19	(0.51, 15.12)	
	Enloe Medical Center	48	44	2	4.55	2.88	4.19	(0.51, 15.12)	
Bethencourt, Daniel M.	Surgeon Overall	287	203	6	2.96	2.13	3.68	(1.35, 8.00)	
	Lakewood Regional Medical Center	31	15	0	0.00	2.16	0.00	(0.00, 30.19)	
	Long Beach Memorial Medical Center	256	188	6	3.19	2.13	3.98	(1.46, 8.64)	
Beygui, Ramin E.	Surgeon Overall	34	20	0	0.00	5.33	0.00	(0.00, 9.18)	
	Los Angeles Co. Harbor - UCLA Medical Center	1	1	0	0.00	0.75	0.00	(0.00, 100.0)	
	Santa Monica - UCLA Medical Center	7	7	0	0.00	2.14	0.00	(0.00, 65.16)	
	UCLA Medical Center	26	12	0	0.00	7.56	0.00	(0.00, 10.77)	
Birnbaum, Peter L.	Surgeon Overall	269	217	5	2.30	1.84	3.33	(1.08, 7.75)	
	Community Medical Center - Fresno	75	63	1	1.59	1.87	2.25	(0.06, 12.51)	
	Dominican Hospital	2	1	0	0.00	0.72	0.00	(0.00, 100.0)	
	Fresno Heart Hospital	136	112	4	3.57	1.75	5.43	(1.48, 13.87)	
	St. Agnes Medical Center	56	41	0	0.00	2.06	0.00	(0.00, 11.57)	

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† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Biswas, Shankha S.	Surgeon Overall	9	9	0	0.00	2.11	0.00	(0.00, 51.50)	
	Riverside Community Hospital	9	9	0	0.00	2.11	0.00	(0.00, 51.50)	
Black, Michael D.	Surgeon Overall	1	0	.	.	.	.		Not Applicable
	California Pacific Medical Center - Pacific Campus	1	0	.	.	.	.		Not Applicable
Blanche, Carlos E.	Surgeon Overall	122	106	3	2.83	2.26	3.32	(0.68, 9.69)	
	St. Jude Medical Center	122	106	3	2.83	2.26	3.32	(0.68, 9.69)	
Bleiweis, Mark S.	Surgeon Overall	25	18	0	0.00	1.82	0.00	(0.00, 29.88)	
	St. Joseph Hospital - Orange	25	18	0	0.00	1.82	0.00	(0.00, 29.88)	
Bogerty, Sharon	Surgeon Overall	5	4	0	0.00	0.75	0.00	(0.00, 100.0)	
	O'Connor Hospital	5	4	0	0.00	0.75	0.00	(0.00, 100.0)	
Brewster, Scot A.	Surgeon Overall	223	135	2	1.48	3.00	1.31	(0.16, 4.73)	
	Scripps Memorial Hospital - La Jolla	223	135	2	1.48	3.00	1.31	(0.16, 4.73)	
Bronstein, Merrill H.	Surgeon Overall	25	25	2	8.00	6.08	3.49	(0.42, 12.59)	
	Dominican Hospital	25	25	2	8.00	6.08	3.49	(0.42, 12.59)	
Buehler, Donald L.	Surgeon Overall	182	120	5	4.17	2.90	3.81	(1.23, 8.87)	
	Scripps Memorial Hospital - La Jolla	182	120	5	4.17	2.90	3.81	(1.23, 8.87)	
Burdon, Thomas A.	Surgeon Overall	2	2	0	0.00	24.00	0.00	(0.00, 20.37)	
	El Camino Hospital	1	1	0	0.00	1.66	0.00	(0.00, 100.0)	
	Stanford University Hospital	1	1	0	0.00	46.34	0.00	(0.00, 21.09)	
Burgess, Nora L.	Surgeon Overall	45	35	2	5.71	1.53	9.94	(1.20, 35.86)	
	Kaiser Foundation Hospital (Geary San Francisco)	45	35	2	5.71	1.53	9.94	(1.20, 35.86)	
Bushnell, Lamar J.	Surgeon Overall	114	101	2	1.98	3.93	1.34	(0.16, 4.82)	
	Community Memorial Hospital of San Buenaventura	114	101	2	1.98	3.93	1.34	(0.16, 4.82)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Cahill, Anne T.	Surgeon Overall	166	140	2	1.43	3.12	1.22	(0.15, 4.39)	
	Lakewood Regional Medical Center	25	23	0	0.00	2.55	0.00	(0.00, 16.70)	
	Long Beach Memorial Medical Center	92	76	1	1.32	2.96	1.18	(0.03, 6.57)	
	Shasta Regional Medical Center	49	41	1	2.44	3.74	1.73	(0.04, 9.63)	
Cain, Brian S.	Surgeon Overall	369	316	6	1.90	2.62	1.92	(0.70, 4.18)	
	Alta Bates Summit Medical Center - Summit Campus	369	316	6	1.90	2.62	1.92	(0.70, 4.18)	
Calhoun, Royce F.	Surgeon Overall	89	68	2	2.94	1.75	4.46	(0.54, 16.10)	
	UC Davis Medical Center	89	68	2	2.94	1.75	4.46	(0.54, 16.10)	
Caminha, Sergio D.	Surgeon Overall	208	176	3	1.70	3.24	1.40	(0.29, 4.08)	
	Kaweah Delta Hospital	208	176	3	1.70	3.24	1.40	(0.29, 4.08)	
Canvasser, David A.	Surgeon Overall	202	155	4	2.58	3.15	2.17	(0.59, 5.55)	
	French Hospital Medical Center	73	52	1	1.92	1.90	2.69	(0.07, 14.96)	
	Marian Medical Center	84	69	1	1.45	2.81	1.37	(0.03, 7.62)	
	Sierra Vista Regional Medical Center	45	34	2	5.88	5.77	2.71	(0.33, 9.76)	
Capouya, Eli R.	Surgeon Overall	215	176	7	3.98	2.49	4.23	(1.70, 8.71)	
	Glendale Adventist Medical Center - Wilson Terrace	116	98	2	2.04	1.92	2.82	(0.34, 10.18)	
	Huntington Memorial Hospital	17	14	0	0.00	2.63	0.00	(0.00, 26.53)	
	Methodist Hospital of Southern California	17	12	2	16.67	4.78	9.25	(1.12, 33.36)	
	Providence St. Joseph Medical Center	35	26	2	7.69	1.60	12.76	(1.54, 46.00)	
	St. Vincent Medical Center	30	26	1	3.85	4.42	2.31	(0.06, 12.84)	
Castro, Luis J.	Surgeon Overall	342	210	5	2.38	2.49	2.54	(0.82, 5.91)	
	Sequoia Hospital	342	210	5	2.38	2.49	2.54	(0.82, 5.91)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Chammas, Joseph H.	Surgeon Overall	78	54	1	1.85	2.89	1.70	(0.04, 9.45)	
	Sharp Memorial Hospital	78	54	1	1.85	2.89	1.70	(0.04, 9.45)	
Chaudhry, Pervaiz A.	Surgeon Overall	205	185	9	4.86	4.06	3.18	(1.45, 6.02)	
	Community Medical Center - Fresno	85	78	5	6.41	4.72	3.61	(1.17, 8.40)	
	Fresno Heart Hospital	32	29	0	0.00	3.94	0.00	(0.00, 8.56)	
	St. Agnes Medical Center	88	78	4	5.13	3.45	3.94	(1.07, 10.08)	
Chaugle, Hannan	Surgeon Overall	22	21	0	0.00	2.06	0.00	(0.00, 22.55)	
	Doctors Medical Center - Modesto Campus	22	21	0	0.00	2.06	0.00	(0.00, 22.55)	
Chen, Raymond H.	Surgeon Overall	527	524	9	1.72	2.10	2.17	(0.99, 4.11)	
	Kaiser Foundation Hospital (Sunset)	527	524	9	1.72	2.10	2.17	(0.99, 4.11)	
Cheng, Wen	Surgeon Overall	48	31	2	6.45	4.67	3.67	(0.44, 13.22)	
	Cedars Sinai Medical Center	48	31	2	6.45	4.67	3.67	(0.44, 13.22)	
Cohen, Robbin G.	Surgeon Overall	235	168	8	4.76	3.19	3.96	(1.71, 7.79)	
	Citrus Valley Medical Center – IC Campus	4	3	0	0.00	0.72	0.00	(0.00, 100.0)	
	Huntington Memorial Hospital	173	123	5	4.07	3.48	3.10	(1.00, 7.22)	
	Los Angeles Co. USC Medical Center	6	6	1	16.67	0.85	51.79	(1.31, 100.0)	
	Methodist Hospital of Southern California	13	11	1	9.09	4.55	5.30	(0.13, 29.49)	
	USC University Hospital	39	25	1	4.00	2.04	5.21	(0.13, 28.99)	
Concepcion, Noel L.	Surgeon Overall	289	232	1	0.43	1.70	0.67	(0.02, 3.75)	
	Doctors Medical Center - Modesto Campus	272	216	1	0.46	1.70	0.72	(0.02, 4.01)	
	Memorial Medical Center of Modesto	8	8	0	0.00	1.57	0.00	(0.00, 78.01)	
	Shasta Regional Medical Center	9	8	0	0.00	1.68	0.00	(0.00, 72.88)	

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† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Connor, Ann R.	Surgeon Overall	41	37	3	8.11	4.62	4.65	(0.96, 13.58)	
	Good Samaritan Hospital - Los Angeles	29	25	2	8.00	5.60	3.79	(0.46, 13.67)	
	Long Beach Memorial Medical Center	5	5	0	0.00	1.75	0.00	(0.00, 100.0)	
	White Memorial Medical Center	7	7	1	14.29	3.18	11.92	(0.30, 66.29)	
Cukingnan, Ramon A.#	Surgeon Overall	115	72	4	5.56	3.92	3.76	(1.02, 9.61)	
	Little Company of Mary Hospital	42	29	3	10.34	5.58	4.92	(1.01, 14.35)	
	Torrance Memorial Medical Center	73	43	1	2.33	2.80	2.20	(0.06, 12.26)	
Cunningham, Mark J.	Surgeon Overall	144	102	2	1.96	3.88	1.34	(0.16, 4.83)	
	Huntington Memorial Hospital	39	29	1	3.45	4.69	1.95	(0.05, 10.87)	
	Los Angeles Co. USC Medical Center	9	7	0	0.00	1.02	0.00	(0.00, 100.0)	
	Methodist Hospital of Southern California	3	3	0	0.00	15.88	0.00	(0.00, 20.52)	
	USC University Hospital	65	41	1	2.44	4.02	1.61	(0.04, 8.96)	
	White Memorial Medical Center	28	22	0	0.00	1.85	0.00	(0.00, 24.04)	
Dajee, Himmet	Surgeon Overall	70	66	3	4.55	3.37	3.58	(0.74, 10.44)	
	Fountain Valley Regional Hospital	64	60	3	5.00	3.60	3.69	(0.76, 10.75)	
	Saddleback Memorial Medical Center	6	6	0	0.00	1.09	0.00	(0.00, 100.0)	
Dandekar, Nandkumar V.	Surgeon Overall	51	46	1	2.17	2.14	2.69	(0.07, 14.97)	
	Citrus Valley Medical Center – IC Campus	40	36	1	2.78	1.78	4.14	(0.10, 23.06)	
	Garfield Medical Center	9	8	0	0.00	3.75	0.00	(0.00, 32.54)	
	Methodist Hospital of Southern California	2	2	0	0.00	2.26	0.00	(0.00, 100.0)	
Darbinian, Sevak H.	Surgeon Overall	21	17	0	0.00	2.40	0.00	(0.00, 23.97)	
	Mission Hospital Regional Medical Center	20	16	0	0.00	2.48	0.00	(0.00, 24.68)	

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† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Surgeon passed away and was unable to review the outcome results presented in this report.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Darbinian, Sevak H.	Saddleback Memorial Medical Center	1	1	0	0.00	1.18	0.00	(0.00, 100.0)	
Davtyan, Hakob G.	Surgeon Overall	363	307	9	2.93	2.46	3.16	(1.44, 6.00)	
	Riverside Community Hospital	57	51	2	3.92	2.66	3.91	(0.47, 14.09)	
	St. Bernardine Medical Center	208	177	7	3.95	2.36	4.44	(1.78, 9.14)	
	St. Mary Regional Medical Center	98	79	0	0.00	2.54	0.00	(0.00, 4.87)	
Declusin, Richard J.	Surgeon Overall	203	151	3	1.99	2.93	1.80	(0.37, 5.26)	
	Los Robles Regional Medical Center	41	33	0	0.00	2.77	0.00	(0.00, 10.69)	
	St. John's Regional Medical Center	162	118	3	2.54	2.97	2.27	(0.47, 6.63)	
Deeik, Ramzi K.	Surgeon Overall	244	203	3	1.48	3.24	1.21	(0.25, 3.53)	
	Queen of the Valley Hospital	231	193	3	1.55	3.31	1.25	(0.26, 3.64)	
	Santa Rosa Memorial Hospital	13	10	0	0.00	2.05	0.00	(0.00, 47.77)	
Dein, John R.	Surgeon Overall	429	282	4	1.42	1.58	2.38	(0.65, 6.09)	
	Mercy General Hospital	412	270	3	1.11	1.45	2.03	(0.42, 5.92)	
	Mercy San Juan Hospital	17	12	1	8.33	4.44	4.98	(0.13, 27.72)	
Del Campo, Carlos	Surgeon Overall	124	107	3	2.80	1.75	4.25	(0.87, 12.39)	
	St. Jude Medical Center	80	68	1	1.47	1.52	2.58	(0.07, 14.32)	
	Western Medical Center Hospital - Anaheim	44	39	2	5.13	2.16	6.29	(0.76, 22.68)	
Delrio, Michael J.	Surgeon Overall	199	172	6	3.49	3.03	3.06	(1.12, 6.64)	
	Riverside Community Hospital	174	150	6	4.00	3.04	3.49	(1.28, 7.58)	
	St. Bernardine Medical Center	25	22	0	0.00	2.92	0.00	(0.00, 15.21)	
Dembitsky, Walter P.	Surgeon Overall	177	78	0	0.00	1.30	0.00	(0.00, 9.61)	
	Sharp Memorial Hospital	177	78	0	0.00	1.30	0.00	(0.00, 9.61)	
Derenoncourt, Frantz J.	Surgeon Overall	60	54	1	1.85	3.33	1.48	(0.04, 8.22)	
	Alvarado Hospital Medical Center	28	26	1	3.85	3.73	2.74	(0.07, 15.22)	
	Sharp Chula Vista Medical Center	32	28	0	0.00	2.95	0.00	(0.00, 11.84)	
Derrick, Marvin J.	Surgeon Overall	325	271	15	5.54	2.25	6.54	(3.66, 10.78)	Worse
	Bakersfield Heart Hospital	118	96	6	6.25	2.18	7.59	(2.78, 16.50)	Worse

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Derrick, Marvin J.	Bakersfield Memorial Hospital	187	157	8	5.10	2.15	6.28	(2.71, 12.36)	Worse
	San Joaquin Community Hospital	20	18	1	5.56	3.37	4.37	(0.11, 24.33)	
Dhar, Naveen	Surgeon Overall	138	130	10	7.69	2.64	7.75	(3.71, 14.23)	Worse
	Anaheim Memorial Medical Center	6	6	0	0.00	2.94	0.00	(0.00, 55.44)	
	Fountain Valley Regional Hospital	33	31	2	6.45	2.98	5.74	(0.69, 20.70)	
	West Anaheim Medical Center	15	15	1	6.67	1.96	9.01	(0.23, 50.13)	
	Western Medical Center - Santa Ana	11	10	1	10.00	4.14	6.42	(0.16, 35.70)	
	Western Medical Center Hospital – Anaheim	73	68	6	8.82	2.38	9.85	(3.61, 21.41)	
Dharan, Murali	Surgeon Overall	224	190	3	1.58	2.87	1.46	(0.30, 4.26)	
	John Muir Medical Center - Walnut Creek Campus	5	4	0	0.00	0.99	0.00	(0.00, 100.0)	
	John Muir Medical Center - Concord Campus	77	66	1	1.52	2.98	1.35	(0.03, 7.51)	
	San Ramon Regional Medical Center	125	105	1	0.95	1.99	1.27	(0.03, 7.06)	
	Valleycare Medical Center	17	15	1	6.67	9.01	1.96	(0.05, 10.92)	
Dhawan, Puneet	Surgeon Overall	53	52	1	1.92	1.31	3.88	(0.10, 21.60)	
	Desert Regional Medical Center	53	52	1	1.92	1.31	3.88	(0.10, 21.60)	
Dhillon, Jatinder S.	Surgeon Overall	201	179	1	0.56	2.70	0.55	(0.01, 3.05)	
	John Muir Medical Center - Walnut Creek Campus	9	9	1	11.11	12.35	2.39	(0.06, 13.28)	
	John Muir Medical Center - Concord Campus	183	161	0	0.00	2.24	0.00	(0.00, 2.71)	
	San Ramon Regional Medical Center	9	9	0	0.00	1.23	0.00	(0.00, 88.27)	
Dox, Hector A.	Surgeon Overall	125	109	1	0.92	2.20	1.11	(0.03, 6.15)	
	Salinas Valley Memorial Hospital	125	109	1	0.92	2.20	1.11	(0.03, 6.15)	
Durzinsky, Dennis S.	Surgeon Overall	205	172	1	0.58	2.01	0.77	(0.02, 4.27)	
	Alta Bates Summit Medical Center - Summit Campus	205	172	1	0.58	2.01	0.77	(0.02, 4.27)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Edwards, Phyllis A.	Surgeon Overall	116	107	7	6.54	2.78	6.25	(2.51, 12.86)	
	Kaweah Delta Hospital	116	107	7	6.54	2.78	6.25	(2.51, 12.86)	
Ehrman, Walter J.	Surgeon Overall	2	0	.	.	.	.		Not Applicable
	Desert Regional Medical Center	2	0	.	.	.	.		Not Applicable
Ellis, Robert J.	Surgeon Overall	76	58	0	0.00	2.47	0.00	(0.00, 6.81)	
	California Pacific Medical Center - Pacific Campus	7	4	0	0.00	2.03	0.00	(0.00, 100.0)	
	Marin General Hospital	48	38	0	0.00	2.56	0.00	(0.00, 10.06)	
	St. Mary's Medical Center, San Francisco	21	16	0	0.00	2.39	0.00	(0.00, 25.60)	
Ennix, Coyness L.	Surgeon Overall	66	58	3	5.17	2.56	5.35	(1.10, 15.62)	
	Alta Bates Summit Medical Center - Summit Campus	61	55	3	5.45	2.59	5.59	(1.15, 16.31)	
	Doctors Medical Center - San Pablo Campus	4	3	0	0.00	2.09	0.00	(0.00, 100.0)	
	San Ramon Regional Medical Center	1	0	.	.	.	.		Not Applicable
Esmailian, Fardad	Surgeon Overall	130	87	2	2.30	2.86	2.13	(0.26, 7.70)	
	Santa Monica - UCLA Medical Center	23	15	1	6.67	3.60	4.92	(0.12, 27.36)	
	UCLA Medical Center	107	72	1	1.39	2.71	1.36	(0.03, 7.58)	
Estioko, Manuel R.	Surgeon Overall	50	42	1	2.38	3.17	2.00	(0.05, 11.10)	
	Good Samaritan Hospital - Los Angeles	1	0	.	.	.	.		Not Applicable
	St. John's Hospital and Health Center	49	42	1	2.38	3.17	2.00	(0.05, 11.10)	
Eugene, John	Surgeon Overall	63	58	6	10.34	2.55	10.77	(3.94, 23.40)	Worse
	Anaheim Memorial Medical Center	18	15	3	20.00	3.08	17.26	(3.55, 50.34)	Worse
	Little Company of Mary Hospital	2	2	0	0.00	2.57	0.00	(0.00, 100.0)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Eugene, John	Torrance Memorial Medical Center	1	1	1	100.00	7.82	33.95	(0.86, 100.0)	
	West Anaheim Medical Center	24	22	2	9.09	2.42	9.98	(1.21, 35.98)	
	Western Medical Center - Santa Ana	6	6	0	0.00	2.38	0.00	(0.00, 68.40)	
	Western Medical Center Hospital - Anaheim	12	12	0	0.00	1.78	0.00	(0.00, 45.89)	
Faber, Luke A.	Surgeon Overall	142	99	2	2.02	2.36	2.27	(0.27, 8.19)	
	French Hospital Medical Center	95	60	0	0.00	1.67	0.00	(0.00, 9.73)	
	Marian Medical Center	30	24	1	4.17	2.76	4.00	(0.10, 22.25)	
	Sierra Vista Regional Medical Center	17	15	1	6.67	4.46	3.97	(0.10, 22.09)	
Fann, James I.	Surgeon Overall	6	6	0	0.00	1.21	0.00	(0.00, 100.0)	
	El Camino Hospital	4	4	0	0.00	1.30	0.00	(0.00, 100.0)	
	Stanford University Hospital	2	2	0	0.00	1.03	0.00	(0.00, 100.0)	
Fee, Henry J.	Surgeon Overall	153	127	7	5.51	2.75	5.32	(2.14, 10.95)	
	Good Samaritan Hospital - San Jose	70	57	3	5.26	3.33	4.20	(0.86, 12.24)	
	O'Connor Hospital	83	70	4	5.71	2.27	6.67	(1.81, 17.05)	
Felahy, Isam	Surgeon Overall	137	129	5	3.88	2.07	4.96	(1.61, 11.56)	
	Dameron Hospital	10	10	2	20.00	1.86	28.56	(3.45, 100.0)	Worse
	St. Joseph's Medical Center of Stockton	127	119	3	2.52	2.09	3.20	(0.66, 9.33)	
Fischbein, Michael P.	Surgeon Overall	9	8	0	0.00	6.03	0.00	(0.00, 20.28)	
	Regional Medical of San Jose	3	3	0	0.00	1.86	0.00	(0.00, 100.0)	
	Santa Clara Valley Medical Center	1	1	0	0.00	2.04	0.00	(0.00, 100.0)	
	Stanford University Hospital	5	4	0	0.00	10.15	0.00	(0.00, 24.07)	
Flachsbart, Keith D.	Surgeon Overall	80	42	2	4.76	2.39	5.29	(0.64, 19.08)	
	Kaiser Foundation Hospital (Geary San Francisco)	80	42	2	4.76	2.39	5.29	(0.64, 19.08)	

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Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Florida, Rosario	Surgeon Overall	22	21	0	0.00	3.83	0.00	(0.00, 12.16)	
	Loma Linda University Medical Center	22	21	0	0.00	3.83	0.00	(0.00, 12.16)	
Folkerth, Theodore L.	Surgeon Overall	238	184	5	2.72	1.49	4.83	(1.57, 11.26)	
	Tri-City Medical Center	238	184	5	2.72	1.49	4.83	(1.57, 11.26)	
Fontana, Gregory P.	Surgeon Overall	86	56	1	1.79	2.33	2.04	(0.05, 11.33)	
	Cedars Sinai Medical Center	86	56	1	1.79	2.33	2.04	(0.05, 11.33)	
Freyaldenhoven, Stephen J.	Surgeon Overall	152	120	3	2.50	2.71	2.44	(0.50, 7.13)	
	French Hospital Medical Center	50	40	0	0.00	2.23	0.00	(0.00, 10.94)	
	Marian Medical Center	82	65	2	3.08	2.50	3.27	(0.39, 11.78)	
	Sierra Vista Regional Medical Center	20	15	1	6.67	4.92	3.60	(0.09, 20.00)	
Fung, Lit K.	Surgeon Overall	370	301	7	2.33	2.21	2.79	(1.12, 5.74)	
	Doctors Medical Center - Modesto Campus	59	52	0	0.00	1.28	0.00	(0.00, 14.66)	
	Memorial Medical Center of Modesto	311	249	7	2.81	2.40	3.10	(1.25, 6.38)	
Gates, Richard N.	Surgeon Overall	114	87	1	1.15	1.51	2.02	(0.05, 11.26)	
	Mission Hospital Regional Medical Center	1	0	.	.	.	.		Not Applicable
	Saddleback Memorial Medical Center	2	0	.	.	.	.		Not Applicable
	St. Joseph Hospital - Orange	110	86	1	1.16	1.50	2.06	(0.05, 11.47)	
	St. Jude Medical Center	1	1	0	0.00	2.40	0.00	(0.00, 100.0)	
Gaudiani, Vincent A.	Surgeon Overall	160	71	2	2.82	2.44	3.07	(0.37, 11.06)	
	Sequoia Hospital	160	71	2	2.82	2.44	3.07	(0.37, 11.06)	
Gharavi, Mohammad A.	Surgeon Overall	303	234	1	0.43	2.63	0.43	(0.01, 2.40)	Better
	Encino Tarzana Regional Medical Center - Tarzana	162	124	0	0.00	2.39	0.00	(0.00, 3.29)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% , RAMR)	95% CI for RAMR	Performance Rating*	
State of California†		41,256	32,586	865	2.65					
Gharavi, Mohammad A.	Los Robles Regional Medical Center	101	74	1	1.35	3.45	1.04	(0.03, 5.79)		
	West Hills Regional Medical Center	40	36	0	0.00	1.79	0.00	(0.00, 15.16)		
Gheissari, Ali	Surgeon Overall	195	150	2	1.33	2.90	1.22	(0.15, 4.41)		
	Glendale Adventist Medical Center - Wilson Terrace	46	33	0	0.00	2.19	0.00	(0.00, 13.52)		
	Good Samaritan Hospital - Los Angeles	3	2	0	0.00	2.32	0.00	(0.00, 100.0)		
	Huntington Memorial Hospital	5	5	1	20.00	7.24	7.33	(0.19, 40.77)		
	Methodist Hospital of Southern California	12	9	0	0.00	3.69	0.00	(0.00, 29.44)		
	Providence St. Joseph Medical Center	27	17	0	0.00	1.59	0.00	(0.00, 36.16)		
	St. Vincent Medical Center	102	84	1	1.19	3.11	1.02	(0.03, 5.66)		
	Gibson, Christopher F.	Surgeon Overall	425	358	16	4.47	2.66	4.46	(2.55, 7.24)	
	Riverside Community Hospital	68	57	1	1.75	3.01	1.55	(0.04, 8.60)		
	St. Bernardine Medical Center	257	218	9	4.13	2.67	4.11	(1.88, 7.79)		
	St. Mary Regional Medical Center	100	83	6	7.23	2.39	8.02	(2.94, 17.44)	Worse	
Giritsky, Alexander S.	Surgeon Overall	153	129	2	1.55	3.66	1.12	(0.14, 4.05)		
	Scripps Memorial Hospital - La Jolla	153	129	2	1.55	3.66	1.12	(0.14, 4.05)		
	Gottner, Robert J.	Surgeon Overall	184	163	1	0.61	2.28	0.72	(0.02, 3.98)	
	Glendale Adventist Medical Center - Wilson Terrace	6	6	0	0.00	1.74	0.00	(0.00, 93.44)		
	Huntington Memorial Hospital	2	1	0	0.00	2.11	0.00	(0.00, 100.0)		
	Methodist Hospital of Southern California	120	109	1	0.92	2.26	1.08	(0.03, 5.98)		
	Providence St. Joseph Medical Center	41	32	0	0.00	2.34	0.00	(0.00, 13.05)		
	St. Vincent Medical Center	15	15	0	0.00	2.44	0.00	(0.00, 26.67)		

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† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Gregory, Richard D.	Surgeon Overall	362	312	5	1.60	2.18	1.95	(0.63, 4.54)	
	Community Medical Center - Fresno	38	35	1	2.86	3.17	2.39	(0.06, 13.29)	
	Dominican Hospital	4	4	0	0.00	1.49	0.00	(0.00, 100.0)	
	Fresno Heart Hospital	213	178	2	1.12	2.19	1.36	(0.16, 4.90)	
	St. Agnes Medical Center	107	95	2	2.11	1.83	3.06	(0.37, 11.02)	
Grehl, Todd M.	Surgeon Overall	7	6	1	16.67	1.74	25.40	(0.64, 100.0)	
	Tri-City Medical Center	7	6	1	16.67	1.74	25.40	(0.64, 100.0)	
Griffith, Patrick K.	Surgeon Overall	286	198	6	3.03	2.46	3.27	(1.20, 7.12)	
	Rideout Memorial Hospital	286	198	6	3.03	2.46	3.27	(1.20, 7.12)	
Gundry, Steven R.	Surgeon Overall	79	45	1	2.22	7.13	0.83	(0.02, 4.60)	
	Desert Regional Medical Center	79	45	1	2.22	7.13	0.83	(0.02, 4.60)	
Gunupati, Venkata C.	Surgeon Overall	3	2	1	50.00	0.93	100.00	(3.60, 100.0)	Worse
	Citrus Valley Medical Center – IC Campus	3	2	1	50.00	0.93	100.00	(3.60, 100.0)	Worse
Habibipour, Saied	Surgeon Overall	326	281	10	3.56	2.29	4.12	(1.97, 7.56)	
	Desert Regional Medical Center	313	269	10	3.72	2.30	4.28	(2.05, 7.86)	
	Eisenhower Memorial Hospital	13	12	0	0.00	2.09	0.00	(0.00, 39.01)	
Hall, James D.	Surgeon Overall	182	118	8	6.78	2.97	6.06	(2.61, 11.91)	
	Little Company of Mary Hospital	66	43	1	2.33	2.26	2.73	(0.07, 15.19)	
	Torrance Memorial Medical Center	116	75	7	9.33	3.38	7.33	(2.94, 15.08)	Worse
Harmon, Adam L.	Surgeon Overall	116	94	4	4.26	2.63	4.30	(1.17, 11.00)	
	Washington Hospital - Fremont	116	94	4	4.26	2.63	4.30	(1.17, 11.00)	
Hasaniya, Nahidh W.	Surgeon Overall	130	106	3	2.83	2.42	3.11	(0.64, 9.06)	
	Loma Linda University Medical Center	127	103	3	2.91	2.44	3.17	(0.65, 9.26)	
	Riverside Community Hospital	3	3	0	0.00	1.78	0.00	(0.00, 100.0)	
Hemp, James R.	Surgeon Overall	184	146	1	0.68	2.27	0.80	(0.02, 4.46)	
	Scripps Green Hospital	35	26	0	0.00	2.69	0.00	(0.00, 13.97)	
	Scripps Mercy Hospital	149	120	1	0.83	2.18	1.02	(0.03, 5.65)	

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† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Hernandez, Jose G.	Surgeon Overall	2	1	0	0.00	3.62	0.00	(0.00, 100.0)	
	Sharp Chula Vista Medical Center	2	1	0	0.00	3.62	0.00	(0.00, 100.0)	
Hill, Arthur C.	Surgeon Overall	96	83	0	0.00	1.83	0.00	(0.00, 6.42)	
	UCSF Medical Center	96	83	0	0.00	1.83	0.00	(0.00, 6.42)	
Hom, Sophia S.	Surgeon Overall	23	20	2	10.00	4.85	5.45	(0.66, 19.72)	
	Centinela Hospital Medical Center	2	2	0	0.00	5.62	0.00	(0.00, 86.93)	
	Good Samaritan Hospital - Los Angeles	20	17	2	11.76	4.88	6.38	(0.77, 23.09)	
	St. Vincent Medical Center	1	1	0	0.00	2.94	0.00	(0.00, 100.0)	
Hood, James S.	Surgeon Overall	227	173	3	1.73	1.63	2.82	(0.58, 8.22)	
	Kaiser Foundation Hospital (Geary San Francisco)	227	173	3	1.73	1.63	2.82	(0.58, 8.22)	
Hoopes, Charles W.	Surgeon Overall	60	59	1	1.69	3.75	1.20	(0.03, 6.67)	
	UCSF Medical Center	60	59	1	1.69	3.75	1.20	(0.03, 6.67)	
Housman, Leland B.	Surgeon Overall	122	108	1	0.93	2.40	1.02	(0.03, 5.69)	
	Scripps Green Hospital	99	90	1	1.11	2.63	1.12	(0.03, 6.23)	
	Scripps Mercy Hospital	23	18	0	0.00	1.26	0.00	(0.00, 43.11)	
Howden, Frederick M.	Surgeon Overall	120	98	2	2.04	1.72	3.14	(0.38, 11.33)	
	Alvarado Hospital Medical Center	112	92	2	2.17	1.75	3.30	(0.40, 11.89)	
	Sharp Grossmont Hospital	8	6	0	0.00	1.31	0.00	(0.00, 100.0)	
Huang, Mark W.	Surgeon Overall	41	38	0	0.00	3.47	0.00	(0.00, 7.40)	
	Alvarado Hospital Medical Center	1	1	0	0.00	1.38	0.00	(0.00, 100.0)	
	Sharp Chula Vista Medical Center	38	35	0	0.00	3.62	0.00	(0.00, 7.71)	
	Sharp Grossmont Hospital	2	2	0	0.00	1.89	0.00	(0.00, 100.0)	
Huang, Ming-Lu	Surgeon Overall	373	302	8	2.65	2.98	2.36	(1.02, 4.63)	
	Beverly Hospital	3	3	0	0.00	3.17	0.00	(0.00, 100.0)	
	Citrus Valley Medical Center – IC Campus	101	73	4	5.48	3.26	4.46	(1.21, 11.40)	
	Garfield Medical Center	222	183	3	1.64	3.11	1.40	(0.29, 4.08)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% , RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Huang, Ming-Lu	Methodist Hospital of Southern California	45	41	1	2.44	1.97	3.29	(0.08, 18.28)	
	USC University Hospital	2	2	0	0.00	1.57	0.00	(0.00, 100.0)	
Huh, Joseph	Surgeon Overall	2	2	0	0.00	1.15	0.00	(0.00, 100.0)	
	Kaiser Foundation Hospital (Sunset)	2	2	0	0.00	1.15	0.00	(0.00, 100.0)	
Hurwitz, Andrew S.	Surgeon Overall	93	84	4	4.76	3.70	3.41	(0.93, 8.72)	
	Glendale Adventist Medical Center - Wilson Terrace	15	15	1	6.67	3.99	4.43	(0.11, 24.65)	
	Glendale Memorial Hospital and Health Center	78	69	3	4.35	3.64	3.17	(0.65, 9.25)	
Husain, Syed A.	Surgeon Overall	165	139	3	2.16	2.66	2.16	(0.44, 6.29)	
	Mission Hospital Regional Medical Center	98	84	1	1.19	2.19	1.44	(0.04, 8.02)	
	Saddleback Memorial Medical Center	67	55	2	3.64	3.37	2.87	(0.35, 10.34)	
Ihnken, Kai A.	Surgeon Overall	102	91	2	2.20	2.70	2.16	(0.26, 7.78)	
	El Camino Hospital	4	4	0	0.00	3.47	0.00	(0.00, 70.51)	
	Regional Medical of San Jose	17	16	0	0.00	1.46	0.00	(0.00, 41.87)	
	Santa Clara Valley Medical Center	27	24	0	0.00	1.91	0.00	(0.00, 21.38)	
	Stanford University Hospital	22	18	0	0.00	5.22	0.00	(0.00, 10.41)	
	UCSD Medical Center	26	24	2	8.33	1.49	14.88	(1.80, 53.66)	
	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	6	5	0	0.00	6.70	0.00	(0.00, 29.18)	
Ingram, Michael T.	Surgeon Overall	336	227	4	1.76	2.20	2.12	(0.58, 5.43)	
	Sutter Memorial Hospital	336	227	4	1.76	2.20	2.12	(0.58, 5.43)	
Iverson, Leigh I.	Surgeon Overall	84	74	2	2.70	2.31	3.11	(0.38, 11.20)	
	Alta Bates Summit Medical Center - Summit Campus	72	62	2	3.23	2.25	3.80	(0.46, 13.70)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Iverson, Leigh I.	Doctors Medical Center - San Pablo Campus	12	12	0	0.00	2.59	0.00	(0.00, 31.43)	
Iyengar, Sridhara K.	Surgeon Overall	63	58	0	0.00	2.00	0.00	(0.00, 8.41)	
	Anaheim Memorial Medical Center	1	1	0	0.00	0.73	0.00	(0.00, 100.0)	
	Fountain Valley Regional Hospital	55	52	0	0.00	2.04	0.00	(0.00, 9.21)	
	Saddleback Memorial Medical Center	4	3	0	0.00	1.73	0.00	(0.00, 100.0)	
	Western Medical Center Hospital - Anaheim	3	2	0	0.00	2.05	0.00	(0.00, 100.0)	
Jacobson, John G.	Surgeon Overall	122	105	6	5.71	3.18	4.78	(1.75, 10.38)	
	St. Helena Hospital	122	105	6	5.71	3.18	4.78	(1.75, 10.38)	
Jain, Sarika	Surgeon Overall	137	134	2	1.49	3.51	1.13	(0.14, 4.07)	
	Pomona Valley Hospital Medical Center	137	134	2	1.49	3.51	1.13	(0.14, 4.07)	
Jamieson, Stuart W.	Surgeon Overall	24	6	0	0.00	1.59	0.00	(0.00, 100.0)	
	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	24	6	0	0.00	1.59	0.00	(0.00, 100.0)	
Joyo, Colin I.	Surgeon Overall	174	140	4	2.86	2.30	3.30	(0.90, 8.43)	
	Hoag Memorial Hospital Presbyterian	174	140	4	2.86	2.30	3.30	(0.90, 8.43)	
Kamlot, Andreas	Surgeon Overall	31	27	2	7.41	1.69	11.67	(1.41, 42.08)	
	Mt. Diablo Medical Center	31	27	2	7.41	1.69	11.67	(1.41, 42.08)	
Kaplon, Richard J.	Surgeon Overall	488	327	7	2.14	1.69	3.37	(1.35, 6.93)	
	Mercy General Hospital	456	300	7	2.33	1.63	3.80	(1.52, 7.81)	
	Mercy San Juan Hospital	32	27	0	0.00	2.31	0.00	(0.00, 15.68)	
Kass, Robert M.	Surgeon Overall	136	85	3	3.53	2.96	3.17	(0.65, 9.23)	
	Cedars Sinai Medical Center	136	85	3	3.53	2.96	3.17	(0.65, 9.23)	
Khan, Aziz A.	Surgeon Overall	48	45	1	2.22	2.23	2.65	(0.07, 14.72)	
	Beverly Hospital	46	44	1	2.27	2.24	2.69	(0.07, 14.95)	

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Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Khan, Aziz A.	Presbyterian Intercommunity Hospital	2	1	0	0.00	1.51	0.00	(0.00, 100.0)	
Khan, Junaid H.	Surgeon Overall	185	151	5	3.31	2.89	3.04	(0.99, 7.09)	
	Alta Bates Summit Medical Center - Summit Campus	166	135	5	3.70	2.30	4.28	(1.39, 9.96)	
	Doctors Medical Center - San Pablo Campus	19	16	0	0.00	7.86	0.00	(0.00, 7.78)	
Khwaja, Shamsuddin	Surgeon Overall	204	174	5	2.87	2.58	2.95	(0.96, 6.88)	
	Community Medical Center - Fresno	101	87	4	4.60	3.01	4.05	(1.10, 10.36)	
	Fresno Heart Hospital	52	39	0	0.00	2.02	0.00	(0.00, 12.40)	
	St. Agnes Medical Center	51	48	1	2.08	2.26	2.45	(0.06, 13.61)	
Kincade, Robert C.	Surgeon Overall	218	176	7	3.98	2.83	3.73	(1.50, 7.68)	
	Shasta Regional Medical Center	10	8	0	0.00	3.40	0.00	(0.00, 35.97)	
	Sutter Memorial Hospital	208	168	7	4.17	2.80	3.95	(1.59, 8.12)	
Klingman, Robert R.	Surgeon Overall	232	200	8	4.00	3.41	3.11	(1.34, 6.12)	
	Queen of the Valley Hospital	232	200	8	4.00	3.41	3.11	(1.34, 6.12)	
Kochamba, Gary S.	Surgeon Overall	401	314	7	2.23	3.02	1.96	(0.79, 4.04)	
	Kaiser Foundation Hospital (Sunset)	399	312	7	2.24	3.03	1.96	(0.79, 4.04)	
	St. Bernardine Medical Center	2	2	0	0.00	0.61	0.00	(0.00, 100.0)	
Korver, Keith F.	Surgeon Overall	227	156	2	1.28	1.67	2.04	(0.25, 7.37)	
	Santa Rosa Memorial Hospital	6	5	0	0.00	0.67	0.00	(0.00, 100.0)	
	Sequoia Hospital	1	0	.	.	.	.		Not Applicable
	Sutter Medical Center of Santa Rosa	220	151	2	1.32	1.70	2.07	(0.25, 7.47)	
Koumjian, Michael P.	Surgeon Overall	180	164	5	3.05	2.32	3.48	(1.13, 8.12)	
	Alvarado Hospital Medical Center	1	1	0	0.00	0.56	0.00	(0.00, 100.0)	

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Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Koumjian, Michael P.	Scripps Mercy Hospital	10	8	0	0.00	5.28	0.00	(0.00, 23.13)	
	Sharp Chula Vista Medical Center	37	36	1	2.78	1.81	4.08	(0.10, 22.72)	
	Sharp Grossmont Hospital	125	112	4	3.57	2.30	4.12	(1.12, 10.52)	
	Shasta Regional Medical Center	7	7	0	0.00	2.17	0.00	(0.00, 64.48)	
Kriett, Jolene M.	Surgeon Overall	3	1	1	100.00	2.25	100.00	(2.98, 100.0)	Worse
	UCSD Medical Center	1	0	.	.	.	.		Not Applicable
	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	2	1	1	100.00	2.25	100.00	(2.98, 100.0)	Worse
Labourene, Jay I.	Surgeon Overall	205	136	1	0.74	1.70	1.15	(0.03, 6.37)	
	Kaiser Foundation Hospital (Geary San Francisco)	205	136	1	0.74	1.70	1.15	(0.03, 6.37)	
Laks, Hillel	Surgeon Overall	105	45	1	2.22	2.31	2.55	(0.06, 14.22)	
	UCLA Medical Center	105	45	1	2.22	2.31	2.55	(0.06, 14.22)	
Lapunzina, Paul M.	Surgeon Overall	231	183	2	1.09	1.60	1.81	(0.22, 6.52)	
	Kaiser Foundation Hospital (Geary San Francisco)	231	183	2	1.09	1.60	1.81	(0.22, 6.52)	
Laughlin, Lawrence L.	Surgeon Overall	29	24	1	4.17	1.75	6.32	(0.16, 35.14)	
	Citrus Valley Medical Center – IC Campus	28	23	1	4.35	1.74	6.63	(0.17, 36.90)	
	Methodist Hospital of Southern California	1	1	0	0.00	2.01	0.00	(0.00, 100.0)	
Lee, Anthony W.	Surgeon Overall	174	162	3	1.85	1.94	2.54	(0.52, 7.41)	
	Downey Regional Medical Center	75	71	0	0.00	1.33	0.00	(0.00, 10.34)	
	St. Francis Medical Center	99	91	3	3.30	2.41	3.63	(0.75, 10.60)	
Lee, Hon S.	Surgeon Overall	244	178	1	0.56	3.01	0.50	(0.01, 2.76)	
	Alta Bates Summit Medical Center - Summit Campus	244	178	1	0.56	3.01	0.50	(0.01, 2.76)	
Lee, Kenneth T.	Surgeon Overall	7	4	0	0.00	4.90	0.00	(0.00, 49.90)	
	Washington Hospital - Fremont	7	4	0	0.00	4.90	0.00	(0.00, 49.90)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Lee, Sang H.	Surgeon Overall	163	142	9	6.34	2.89	5.83	(2.66, 11.05)	Worse
	O'Connor Hospital	6	6	0	0.00	0.99	0.00	(0.00, 100.0)	
	Washington Hospital - Fremont	157	136	9	6.62	2.97	5.92	(2.70, 11.21)	Worse
Lemire, Guy G.	Surgeon Overall	127	107	4	3.74	2.56	3.88	(1.05, 9.91)	
	Anaheim Memorial Medical Center	101	86	2	2.33	2.60	2.37	(0.29, 8.56)	
	Lakewood Regional Medical Center	2	1	0	0.00	1.46	0.00	(0.00, 100.0)	
	Long Beach Memorial Medical Center	13	10	2	20.00	2.49	21.28	(2.57, 76.74)	
	West Anaheim Medical Center	11	10	0	0.00	2.38	0.00	(0.00, 41.14)	
Lin, Yuan H.	Surgeon Overall	288	247	14	5.67	3.88	3.88	(2.12, 6.50)	
	Alvarado Hospital Medical Center	32	28	1	3.57	1.43	6.62	(0.17, 36.82)	
	Scripps Mercy Hospital	2	2	0	0.00	1.32	0.00	(0.00, 100.0)	
	Sharp Chula Vista Medical Center	167	145	10	6.90	4.30	4.25	(2.04, 7.81)	
	Sharp Grossmont Hospital	87	72	3	4.17	4.04	2.74	(0.56, 7.99)	
Lindsey, David E.	Surgeon Overall	10	6	0	0.00	1.33	0.00	(0.00, 100.0)	
	John Muir Medical Center - Walnut Creek Campus	2	1	0	0.00	0.52	0.00	(0.00, 100.0)	
	John Muir Medical Center - Concord Campus	5	3	0	0.00	2.27	0.00	(0.00, 100.0)	
	San Ramon Regional Medical Center	3	2	0	0.00	0.32	0.00	(0.00, 100.0)	
Longoria, James	Surgeon Overall	346	251	5	1.99	2.43	2.17	(0.71, 5.08)	
	Shasta Regional Medical Center	2	1	0	0.00	1.22	0.00	(0.00, 100.0)	
	Sutter Memorial Hospital	344	250	5	2.00	2.43	2.18	(0.71, 5.09)	
MacMillan, James C.	Surgeon Overall	102	81	4	4.94	2.43	5.39	(1.47, 13.78)	
	Doctors Medical Center - Modesto Campus	98	77	3	3.90	2.22	4.67	(0.96, 13.62)	
	Memorial Medical Center of Modesto	4	4	1	25.00	6.61	10.05	(0.25, 55.88)	
Madani, Michael M.	Surgeon Overall	110	63	0	0.00	1.64	0.00	(0.00, 9.45)	
	UCSD Medical Center	13	10	0	0.00	2.03	0.00	(0.00, 48.21)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% , RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Madani, Michael M.	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	97	53	0	0.00	1.57	0.00	(0.00, 11.76)	
Magliato, Kathy E.	Surgeon Overall	11	10	0	0.00	2.51	0.00	(0.00, 38.96)	
	St. John's Hospital and Health Center	11	10	0	0.00	2.51	0.00	(0.00, 38.96)	
Mahendra, Tom	Surgeon Overall	51	45	2	4.44	1.65	7.14	(0.86, 25.75)	
	Antelope Valley Hospital Medical Center	39	33	2	6.06	1.50	10.74	(1.30, 38.73)	
	Lancaster Community Hospital	12	12	0	0.00	2.08	0.00	(0.00, 39.24)	
Malekmehr, Farshad	Surgeon Overall	78	69	4	5.80	1.62	9.52	(2.59, 24.33)	
	Glendale Adventist Medical Center - Wilson Terrace	3	3	0	0.00	1.20	0.00	(0.00, 100.0)	
	Valley Presbyterian Hospital	56	50	3	6.00	1.48	10.77	(2.22, 31.41)	
	White Memorial Medical Center	19	16	1	6.25	2.12	7.81	(0.20, 43.45)	
Malki, Alan E.	Surgeon Overall	408	351	14	3.99	3.79	2.79	(1.52, 4.68)	
	Riverside Community Hospital	64	52	1	1.92	2.63	1.94	(0.05, 10.80)	
	St. Bernardine Medical Center	260	231	6	2.60	3.76	1.83	(0.67, 3.98)	
	St. Mary Regional Medical Center	84	68	7	10.29	4.78	5.72	(2.30, 11.77)	
Mallidi, Hari R.	Surgeon Overall	42	38	0	0.00	1.98	0.00	(0.00, 12.96)	
	St. Agnes Medical Center	42	38	0	0.00	1.98	0.00	(0.00, 12.96)	
Mann, Michael J.	Surgeon Overall	4	2	0	0.00	3.00	0.00	(0.00, 100.0)	
	UCSF Medical Center	4	2	0	0.00	3.00	0.00	(0.00, 100.0)	
Marchbanks, Marshall V.	Surgeon Overall	56	44	0	0.00	2.23	0.00	(0.00, 9.97)	
	Santa Rosa Memorial Hospital	56	44	0	0.00	2.23	0.00	(0.00, 9.97)	
Marelli, Daniel	Surgeon Overall	1	1	0	0.00	1.38	0.00	(0.00, 100.0)	
	UCLA Medical Center	1	1	0	0.00	1.38	0.00	(0.00, 100.0)	
Marmureanu, Alexandru R.	Surgeon Overall	4	3	1	33.33	3.07	28.83	(0.73, 100.0)	
	Brotman Medical Center	1	0	Not Applicable

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% , RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Marmureanu, Alexandru R.	Santa Monica - UCLA Medical Center	1	1	1	100.00	1.59	100.00	(4.21, 100.0)	Worse
	St. Vincent Medical Center	1	1	0	0.00	6.87	0.00	(0.00, 100.0)	
	UCLA Medical Center	1	1	0	0.00	0.74	0.00	(0.00, 100.0)	
Mayer, Frederick W.	Surgeon Overall	305	246	10	4.07	3.38	3.19	(1.53, 5.86)	
	Kaweah Delta Hospital	305	246	10	4.07	3.38	3.19	(1.53, 5.86)	
McAfee, Molly K.	Surgeon Overall	17	15	0	0.00	2.36	0.00	(0.00, 27.60)	
	Loma Linda University Medical Center	16	15	0	0.00	2.36	0.00	(0.00, 27.60)	
	Riverside Community Hospital	1	0	.	.	.	.		Not Applicable
McConnell, Douglas H.	Surgeon Overall	111	106	0	0.00	2.15	0.00	(0.00, 4.29)	
	Lakewood Regional Medical Center	58	55	0	0.00	2.38	0.00	(0.00, 7.45)	
	Long Beach Memorial Medical Center	49	47	0	0.00	1.82	0.00	(0.00, 11.45)	
	Shasta Regional Medical Center	4	4	0	0.00	2.84	0.00	(0.00, 86.02)	
McPherson, James G.	Surgeon Overall	126	111	3	2.70	2.79	2.57	(0.53, 7.49)	
	Brotman Medical Center	17	11	0	0.00	2.75	0.00	(0.00, 32.26)	
	Centinela Hospital Medical Center	75	68	2	2.94	3.14	2.49	(0.30, 8.97)	
	Glendale Adventist Medical Center - Wilson Terrace	25	25	0	0.00	1.77	0.00	(0.00, 22.08)	
	Good Samaritan Hospital - Los Angeles	7	5	1	20.00	3.63	14.64	(0.37, 81.43)	
	St. Vincent Medical Center	2	2	0	0.00	2.02	0.00	(0.00, 100.0)	
Melikian, Vicken	Surgeon Overall	227	162	0	0.00	2.16	0.00	(0.00, 2.79)	
	Kaiser Foundation Hospital (Geary San Francisco)	227	162	0	0.00	2.16	0.00	(0.00, 2.79)	
Mellinger, Douglas N.	Surgeon Overall	5	5	0	0.00	3.29	0.00	(0.00, 59.50)	
	UCSD Medical Center	5	5	0	0.00	3.29	0.00	(0.00, 59.50)	
Merrick, Scot H.	Surgeon Overall	108	83	3	3.61	3.03	3.17	(0.65, 9.25)	
	UCSF Medical Center	108	83	3	3.61	3.03	3.17	(0.65, 9.25)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Miller, David C.	Surgeon Overall	31	9	1	11.11	3.19	9.25	(0.23, 51.47)	
	Stanford University Hospital	31	9	1	11.11	3.19	9.25	(0.23, 51.47)	
Milliken, Jeffrey C.	Surgeon Overall	93	68	1	1.47	3.33	1.17	(0.03, 6.52)	
	UC Irvine Medical Center	92	67	1	1.49	3.36	1.18	(0.03, 6.56)	
	Western Medical Center Hospital - Anaheim	1	1	0	0.00	1.17	0.00	(0.00, 100.0)	
Mitchell, Robert L.	Surgeon Overall	3	3	0	0.00	4.01	0.00	(0.00, 81.22)	
	El Camino Hospital	3	3	0	0.00	4.01	0.00	(0.00, 81.22)	
Mitchell, Robert S.	Surgeon Overall	119	71	1	1.41	2.00	1.87	(0.05, 10.37)	
	Stanford University Hospital	119	71	1	1.41	2.00	1.87	(0.05, 10.37)	
Mitruka, Surindra N.	Surgeon Overall	262	215	8	3.72	2.84	3.47	(1.50, 6.83)	
	Eisenhower Memorial Hospital	262	215	8	3.72	2.84	3.47	(1.50, 6.83)	
Mittal, Arun K.	Surgeon Overall	27	22	5	22.73	7.43	8.12	(2.63, 18.92)	
	Centinela Hospital Medical Center	11	8	1	12.50	6.21	5.34	(0.14, 29.73)	
	Little Company of Mary Hospital	11	10	2	20.00	9.17	5.79	(0.70, 20.88)	
	Torrance Memorial Medical Center	5	4	2	50.00	5.51	24.11	(2.91, 86.93)	Worse
Mohammadzadeh, Gholam R.	Surgeon Overall	202	169	6	3.55	3.93	2.40	(0.88, 5.21)	
	Encino Tarzana Regional Medical Center - Tarzana	76	66	1	1.52	3.35	1.20	(0.03, 6.67)	
	Los Robles Regional Medical Center	105	84	3	3.57	3.84	2.47	(0.51, 7.20)	
	St. John's Regional Medical Center	5	4	0	0.00	5.42	0.00	(0.00, 45.10)	
	West Hills Regional Medical Center	16	15	2	13.33	6.56	5.40	(0.65, 19.47)	
Morales, Rodolfo A.	Surgeon Overall	176	135	4	2.96	1.99	3.96	(1.08, 10.12)	
	Good Samaritan Hospital - San Jose	133	98	2	2.04	1.76	3.07	(0.37, 11.09)	
	O'Connor Hospital	43	37	2	5.41	2.58	5.56	(0.67, 20.04)	
Moreno-Cabral, Richardo J.	Surgeon Overall	279	189	7	3.70	3.51	2.80	(1.12, 5.76)	
	Alvarado Hospital Medical Center	7	7	0	0.00	5.61	0.00	(0.00, 24.90)	
	Scripps Mercy Hospital	18	15	2	13.33	1.69	20.99	(2.54, 75.69)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Moreno-Cabral, Richardo J.	Sharp Chula Vista Medical Center	141	90	3	3.33	3.11	2.85	(0.59, 8.31)	
	Sharp Grossmont Hospital	113	77	2	2.60	4.15	1.66	(0.20, 5.98)	
Morris, Allen S.	Surgeon Overall	403	192	0	0.00	1.77	0.00	(0.00, 2.88)	
	Mercy General Hospital	394	186	0	0.00	1.78	0.00	(0.00, 2.95)	
	Mercy San Juan Hospital	9	6	0	0.00	1.35	0.00	(0.00, 100.0)	
Morrissey, James D.	Surgeon Overall	318	272	11	4.04	2.94	3.65	(1.82, 6.52)	
	Dameron Hospital	10	10	1	10.00	6.09	4.36	(0.11, 24.23)	
	St. Joseph's Medical Center of Stockton	308	262	10	3.82	2.82	3.59	(1.72, 6.59)	
Mudge, Devin R.	Surgeon Overall	401	348	12	3.45	2.69	3.40	(1.76, 5.93)	
	Riverside Community Hospital	53	50	3	6.00	1.97	8.07	(1.66, 23.55)	
	St. Bernardine Medical Center	239	213	7	3.29	3.03	2.88	(1.16, 5.93)	
	St. Mary Regional Medical Center	109	85	2	2.35	2.27	2.75	(0.33, 9.93)	
Nathanson, Michael	Surgeon Overall	43	38	1	2.63	0.96	7.28	(0.18, 40.49)	
	Santa Clara Valley Medical Center	43	38	1	2.63	0.96	7.28	(0.18, 40.49)	
Neal, Joe F.	Surgeon Overall	159	122	1	0.82	1.78	1.22	(0.03, 6.79)	
	Doctors Medical Center - Modesto Campus	154	117	1	0.85	1.80	1.26	(0.03, 6.99)	
	Memorial Medical Center of Modesto	3	3	0	0.00	1.48	0.00	(0.00, 100.0)	
	Shasta Regional Medical Center	2	2	0	0.00	0.88	0.00	(0.00, 100.0)	
Nucho, Ramsay C.	Surgeon Overall	119	110	3	2.73	2.87	2.52	(0.52, 7.35)	
	Glendale Adventist Medical Center - Wilson Terrace	41	38	1	2.63	3.29	2.13	(0.05, 11.82)	
	White Memorial Medical Center	78	72	2	2.78	2.66	2.78	(0.34, 10.01)	
Nuno, Ismael N.	Surgeon Overall	236	199	10	5.03	2.41	5.53	(2.65, 10.15)	
	Citrus Valley Medical Center – IC Campus	1	1	1	100.00	3.73	71.09	(1.80, 100.0)	
	Huntington Memorial Hospital	3	2	0	0.00	2.33	0.00	(0.00, 100.0)	

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Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Nuno, Ismael N.	Los Angeles Co. USC Medical Center	153	124	6	4.84	1.56	8.24	(3.02, 17.91)	Worse
	USC University Hospital	10	5	1	20.00	17.76	2.99	(0.08, 16.62)	
	White Memorial Medical Center	69	67	2	2.99	2.83	2.80	(0.34, 10.09)	
Omari, Bassam O.	Surgeon Overall	231	202	6	2.97	2.07	3.81	(1.39, 8.27)	
	Los Angeles Co. Harbor - UCLA Medical Center	213	187	5	2.67	1.89	3.75	(1.22, 8.75)	
	St. Mary Medical Center	2	2	0	0.00	2.41	0.00	(0.00, 100.0)	
	St. Mary Regional Medical Center	16	13	1	7.69	4.62	4.42	(0.11, 24.57)	
Ott, Richard A.	Surgeon Overall	456	391	6	1.53	2.51	1.63	(0.60, 3.53)	
	Anaheim Memorial Medical Center	238	209	4	1.91	2.89	1.76	(0.48, 4.50)	
	Irvine Regional Hospital and Medical Center	68	59	0	0.00	2.38	0.00	(0.00, 6.97)	
	St. Joseph Hospital - Orange	4	3	0	0.00	5.03	0.00	(0.00, 64.83)	
	West Anaheim Medical Center	7	5	0	0.00	2.35	0.00	(0.00, 83.20)	
	Western Medical Center - Santa Ana	134	111	2	1.80	1.80	2.66	(0.32, 9.61)	
	Western Medical Center Hospital - Anaheim	5	4	0	0.00	2.68	0.00	(0.00, 91.36)	
Overton, John B.	Surgeon Overall	19	17	1	5.88	1.74	8.99	(0.23, 50.01)	
	Dameron Hospital	19	17	1	5.88	1.74	8.99	(0.23, 50.01)	
Oyer, Philip E.	Surgeon Overall	85	63	2	3.17	1.76	4.80	(0.58, 17.30)	
	Stanford University Hospital	85	63	2	3.17	1.76	4.80	(0.58, 17.30)	
Palafox, Brian A.	Surgeon Overall	184	135	4	2.96	2.21	3.56	(0.97, 9.10)	
	St. Joseph Hospital - Orange	169	123	4	3.25	2.11	4.09	(1.11, 10.46)	
	Western Medical Center - Santa Ana	15	12	0	0.00	3.24	0.00	(0.00, 25.15)	
Panagiotides, George P.	Surgeon Overall	302	267	5	1.87	2.44	2.04	(0.66, 4.74)	
	Lakewood Regional Medical Center	136	117	4	3.42	3.13	2.90	(0.79, 7.42)	

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Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Panagiotides, George P.	Long Beach Memorial Medical Center	166	150	1	0.67	1.91	0.93	(0.02, 5.16)	
Park, Soon J.	Surgeon Overall	204	139	3	2.16	2.87	2.00	(0.41, 5.83)	
	California Pacific Medical Center - Pacific Campus	130	82	3	3.66	3.06	3.17	(0.65, 9.25)	
	Marin General Hospital	74	57	0	0.00	2.58	0.00	(0.00, 6.64)	
Paw, Patrick T.	Surgeon Overall	258	242	9	3.72	2.03	4.86	(2.22, 9.21)	
	Bakersfield Heart Hospital	58	56	1	1.79	2.27	2.09	(0.05, 11.61)	
	Bakersfield Memorial Hospital	112	103	4	3.88	1.81	5.71	(1.55, 14.59)	
	San Joaquin Community Hospital	88	83	4	4.82	2.15	5.96	(1.62, 15.23)	
Peck, Eric A.	Surgeon Overall	103	91	4	4.40	1.81	6.44	(1.75, 16.46)	
	Bakersfield Heart Hospital	49	44	2	4.55	1.83	6.58	(0.80, 23.72)	
	Bakersfield Memorial Hospital	41	34	0	0.00	1.89	0.00	(0.00, 15.25)	
	San Joaquin Community Hospital	13	13	2	15.38	1.55	26.42	(3.19, 95.26)	Worse
Pelletier, Marc P.	Surgeon Overall	172	123	1	0.81	1.54	1.41	(0.04, 7.82)	
	El Camino Hospital	158	114	0	0.00	1.43	0.00	(0.00, 5.98)	
	Regional Medical of San Jose	5	4	0	0.00	3.79	0.00	(0.00, 64.51)	
	Stanford University Hospital	9	5	1	20.00	2.04	25.99	(0.66, 100.0)	
Peng, Rick Y.	Surgeon Overall	16	13	0	0.00	2.59	0.00	(0.00, 29.05)	
	Rideout Memorial Hospital	16	13	0	0.00	2.59	0.00	(0.00, 29.05)	
Perch, Paul G.	Surgeon Overall	44	44	0	0.00	1.33	0.00	(0.00, 16.75)	
	Kaiser Foundation Hospital (Sunset)	44	44	0	0.00	1.33	0.00	(0.00, 16.75)	
Perkowski, David J.	Surgeon Overall	227	194	5	2.58	2.50	2.74	(0.89, 6.37)	
	Desert Regional Medical Center	8	8	0	0.00	3.53	0.00	(0.00, 34.58)	
	Mission Hospital Regional Medical Center	22	19	0	0.00	3.51	0.00	(0.00, 14.67)	
	Saddleback Memorial Medical Center	185	157	2	1.27	2.32	1.46	(0.18, 5.26)	
	St. Joseph Hospital - Orange	11	9	3	33.33	2.71	32.60	(6.71, 95.10)	Worse

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Perkowski, David J.	St. Jude Medical Center	1	1	0	0.00	2.07	0.00	(0.00, 100.0)	
Perricone, Anthony	Surgeon Overall	84	77	1	1.30	2.08	1.66	(0.04, 9.21)	
	UCSD Medical Center	50	44	1	2.27	1.64	3.68	(0.09, 20.45)	
	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	34	33	0	0.00	2.67	0.00	(0.00, 11.10)	
Petrik, Pavel V.	Surgeon Overall	58	53	1	1.89	1.46	3.42	(0.09, 19.04)	
	Antelope Valley Hospital Medical Center	52	47	1	2.13	1.29	4.36	(0.11, 24.27)	
	Lancaster Community Hospital	6	6	0	0.00	2.79	0.00	(0.00, 58.42)	
Pfeffer, Thomas A.	Surgeon Overall	317	208	8	3.85	3.44	2.97	(1.28, 5.84)	
	Kaiser Foundation Hospital (Sunset)	312	203	8	3.94	3.50	2.99	(1.29, 5.88)	
	St. Bernardine Medical Center	5	5	0	0.00	1.04	0.00	(0.00, 100.0)	
Plunkett, Mark D.	Surgeon Overall	25	16	1	6.25	2.31	7.18	(0.18, 39.91)	
	Los Angeles Co. Harbor - UCLA Medical Center	18	15	1	6.67	2.37	7.48	(0.19, 41.61)	
	UCLA Medical Center	7	1	0	0.00	1.51	0.00	(0.00, 100.0)	
Poa, Li	Surgeon Overall	291	201	6	2.99	3.56	2.22	(0.81, 4.83)	
	Enloe Medical Center	291	201	6	2.99	3.56	2.22	(0.81, 4.83)	
Poirier, Robert A.	Surgeon Overall	211	175	4	2.29	2.80	2.17	(0.59, 5.54)	
	Dominican Hospital	151	126	2	1.59	2.96	1.42	(0.17, 5.13)	
	Fresno Heart Hospital	2	2	0	0.00	0.75	0.00	(0.00, 100.0)	
	St. Agnes Medical Center	58	47	2	4.26	2.45	4.62	(0.56, 16.65)	
Pompili, Mario F.	Surgeon Overall	190	137	2	1.46	1.57	2.46	(0.30, 8.89)	
	Kaiser Foundation Hospital (Geary San Francisco)	190	137	2	1.46	1.57	2.46	(0.30, 8.89)	
Postel, Joachim M.	Surgeon Overall	144	113	2	1.77	2.53	1.86	(0.22, 6.69)	
	St. Joseph Hospital - Eureka	144	113	2	1.77	2.53	1.86	(0.22, 6.69)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Pottmeyer, Edward W.	Surgeon Overall	380	300	4	1.33	3.07	1.15	(0.31, 2.95)	
	Mercy Medical Center - Redding	380	300	4	1.33	3.07	1.15	(0.31, 2.95)	
Prejean, Curtis A.	Surgeon Overall	147	126	4	3.17	3.38	2.49	(0.68, 6.37)	
	Beverly Hospital	1	1	0	0.00	0.85	0.00	(0.00, 100.0)	
	Citrus Valley Medical Center – IC Campus	54	45	3	6.67	3.00	5.89	(1.21, 17.19)	
	Garfield Medical Center	27	25	1	4.00	6.75	1.57	(0.04, 8.75)	
	Huntington Memorial Hospital	4	4	0	0.00	1.54	0.00	(0.00, 100.0)	
	Los Angeles Co. USC Medical Center	18	18	0	0.00	1.44	0.00	(0.00, 37.60)	
	Methodist Hospital of Southern California	5	4	0	0.00	2.24	0.00	(0.00, 100.0)	
	USC University Hospital	32	24	0	0.00	3.18	0.00	(0.00, 12.79)	
	White Memorial Medical Center	6	5	0	0.00	0.76	0.00	(0.00, 100.0)	
Puig-Palomar, Miguel	Surgeon Overall	71	60	2	3.33	3.78	2.34	(0.28, 8.45)	
	Enloe Medical Center	71	60	2	3.33	3.78	2.34	(0.28, 8.45)	
Purewal, Sarabjit S.	Surgeon Overall	299	231	5	2.16	2.04	2.81	(0.91, 6.55)	
	Bakersfield Heart Hospital	204	152	4	2.63	2.17	3.21	(0.87, 8.22)	
	Bakersfield Memorial Hospital	67	56	0	0.00	1.51	0.00	(0.00, 11.56)	
	San Joaquin Community Hospital	28	23	1	4.35	2.49	4.64	(0.12, 25.83)	
Raikar, Goya V.	Surgeon Overall	82	66	1	1.52	4.38	0.92	(0.02, 5.10)	
	Shasta Regional Medical Center	82	66	1	1.52	4.38	0.92	(0.02, 5.10)	
Raissi, Sharo	Surgeon Overall	65	42	3	7.14	2.19	8.65	(1.78, 25.23)	
	Cedars Sinai Medical Center	65	42	3	7.14	2.19	8.65	(1.78, 25.23)	
Raney, Aidan A.	Surgeon Overall	179	88	1	1.14	2.14	1.41	(0.04, 7.83)	
	Hoag Memorial Hospital Presbyterian	179	88	1	1.14	2.14	1.41	(0.04, 7.83)	
Rasi, Alfredo L.	Surgeon Overall	174	148	3	2.03	2.06	2.61	(0.54, 7.63)	
	Loma Linda University Medical Center	168	143	3	2.10	1.93	2.89	(0.60, 8.44)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Rasi, Alfredo L.	Riverside Community Hospital	6	5	0	0.00	5.86	0.00	(0.00, 33.38)	
Razzouk, Anees J.	Surgeon Overall	199	144	3	2.08	3.00	1.85	(0.38, 5.39)	
	Loma Linda University Medical Center	199	144	3	2.08	3.00	1.85	(0.38, 5.39)	
Reddy, Kuruganti R.	Surgeon Overall	2	1	0	0.00	1.15	0.00	(0.00, 100.0)	
	Citrus Valley Medical Center – IC Campus	2	1	0	0.00	1.15	0.00	(0.00, 100.0)	
Reed, William H.	Surgeon Overall	2	2	0	0.00	1.75	0.00	(0.00, 100.0)	
	Sequoia Hospital	2	2	0	0.00	1.75	0.00	(0.00, 100.0)	
Reemtsen, Brian L.	Surgeon Overall	1	1	0	0.00	0.75	0.00	(0.00, 100.0)	
	Los Angeles Co. USC Medical Center	1	1	0	0.00	0.75	0.00	(0.00, 100.0)	
Reichman, Robert T.	Surgeon Overall	186	148	3	2.03	1.39	3.88	(0.80, 11.31)	
	Palomar Medical Center	186	148	3	2.03	1.39	3.88	(0.80, 11.31)	
Reitz, Bruce A.	Surgeon Overall	34	27	0	0.00	2.28	0.00	(0.00, 15.91)	
	Stanford University Hospital	34	27	0	0.00	2.28	0.00	(0.00, 15.91)	
Rich, Andrew A.	Surgeon Overall	11	10	1	10.00	1.66	16.03	(0.41, 89.14)	
	Enloe Medical Center	11	10	1	10.00	1.66	16.03	(0.41, 89.14)	
Richter, Richard C.	Surgeon Overall	186	159	0	0.00	1.92	0.00	(0.00, 3.20)	
	Kaiser Foundation Hospital (Geary San Francisco)	186	159	0	0.00	1.92	0.00	(0.00, 3.20)	
Riebman, Jerome B.	Surgeon Overall	43	41	0	0.00	1.26	0.00	(0.00, 18.99)	
	Santa Clara Valley Medical Center	43	41	0	0.00	1.26	0.00	(0.00, 18.99)	
Robbins, Robert C.	Surgeon Overall	64	48	1	2.08	2.00	2.76	(0.07, 15.34)	
	Stanford University Hospital	64	48	1	2.08	2.00	2.76	(0.07, 15.34)	
Roberts, Randall F.	Surgeon Overall	109	89	4	4.49	2.77	4.30	(1.17, 10.99)	
	Glendale Adventist Medical Center - Wilson Terrace	14	13	0	0.00	1.81	0.00	(0.00, 41.43)	

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Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Roberts, Randall F.	Glendale Memorial Hospital and Health Center	95	76	4	5.26	2.94	4.76	(1.29, 12.15)	
Robertson, John M.	Surgeon Overall	130	102	1	0.98	2.07	1.26	(0.03, 6.99)	
	St. John's Hospital and Health Center	130	102	1	0.98	2.07	1.26	(0.03, 6.99)	
Rooney, John P.	Surgeon Overall	48	47	2	4.26	2.54	4.44	(0.54, 16.01)	
	Dameron Hospital	1	1	1	100.00	7.16	37.08	(0.94, 100.0)	
	St. Joseph's Medical Center of Stockton	47	46	1	2.17	2.44	2.36	(0.06, 13.13)	
Rosenburg, Jeffrey M.	Surgeon Overall	15	11	1	9.09	1.15	21.01	(0.53, 100.0)	
	Palomar Medical Center	15	11	1	9.09	1.15	21.01	(0.53, 100.0)	
Rossiter, Stephen J.	Surgeon Overall	503	424	3	0.71	1.40	1.34	(0.28, 3.92)	
	Mercy General Hospital	485	409	3	0.73	1.39	1.40	(0.29, 4.08)	
	Mercy San Juan Hospital	18	15	0	0.00	1.57	0.00	(0.00, 41.49)	
Sakopoulos, Andreas G.	Surgeon Overall	107	102	4	3.92	5.31	1.96	(0.53, 5.01)	
	St. Helena Hospital	107	102	4	3.92	5.31	1.96	(0.53, 5.01)	
Salem, Fakhri M.	Surgeon Overall	109	96	4	4.17	2.60	4.25	(1.16, 10.87)	
	Scripps Mercy Hospital	98	85	4	4.71	2.69	4.65	(1.26, 11.88)	
	Shasta Regional Medical Center	11	11	0	0.00	1.93	0.00	(0.00, 46.08)	
Savage, David H.	Surgeon Overall	22	16	0	0.00	4.56	0.00	(0.00, 13.39)	
	Rideout Memorial Hospital	22	16	0	0.00	4.56	0.00	(0.00, 13.39)	
Schuch, Douglas R.	Surgeon Overall	111	91	1	1.10	1.71	1.70	(0.04, 9.47)	
	Sutter Memorial Hospital	111	91	1	1.10	1.71	1.70	(0.04, 9.47)	
Schwartz, Steven M.	Surgeon Overall	124	96	3	3.13	3.58	2.32	(0.48, 6.76)	
	Good Samaritan Hospital - San Jose	95	73	2	2.74	3.83	1.90	(0.23, 6.85)	
	O'Connor Hospital	29	23	1	4.35	2.78	4.15	(0.10, 23.10)	
Sellami, Mohamed	Surgeon Overall	36	34	0	0.00	2.63	0.00	(0.00, 10.92)	
	Good Samaritan Hospital - Los Angeles	36	34	0	0.00	2.63	0.00	(0.00, 10.92)	

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Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Serna, Daniel L.	Surgeon Overall	323	322	5	1.55	2.53	1.63	(0.53, 3.80)	
	Kaiser Foundation Hospital (Sunset)	308	307	5	1.63	2.59	1.67	(0.54, 3.89)	
	St. Bernardine Medical Center	15	15	0	0.00	1.30	0.00	(0.00, 50.17)	
Shankar, Kuppe G.	Surgeon Overall	106	73	0	0.00	2.45	0.00	(0.00, 5.46)	
	UC Davis Medical Center	106	73	0	0.00	2.45	0.00	(0.00, 5.46)	
Sharma, Sanjeev K.	Surgeon Overall	87	77	1	1.30	2.46	1.40	(0.04, 7.78)	
	Dameron Hospital	58	51	1	1.96	2.19	2.38	(0.06, 13.24)	
	St. Joseph's Medical Center of Stockton	29	26	0	0.00	3.01	0.00	(0.00, 12.50)	
Sheppard, Barry B.	Surgeon Overall	19	17	1	5.88	6.57	2.38	(0.06, 13.23)	
	Peninsula Medical Center	19	17	1	5.88	6.57	2.38	(0.06, 13.23)	
Shuman, Robert L.	Surgeon Overall	41	37	3	8.11	2.03	10.58	(2.18, 30.87)	
	Long Beach Memorial Medical Center	41	37	3	8.11	2.03	10.58	(2.18, 30.87)	
Silva, Raymond	Surgeon Overall	98	88	2	2.27	3.27	1.85	(0.22, 6.66)	
	Good Samaritan Hospital - San Jose	68	62	2	3.23	3.97	2.16	(0.26, 7.78)	
	O'Connor Hospital	30	26	0	0.00	1.59	0.00	(0.00, 23.70)	
Skow, James R.	Surgeon Overall	90	74	6	8.11	3.69	5.83	(2.14, 12.67)	
	French Hospital Medical Center	34	23	0	0.00	1.63	0.00	(0.00, 26.13)	
	Marian Medical Center	42	38	5	13.16	3.64	9.59	(3.11, 22.34)	Worse
	Sierra Vista Regional Medical Center	14	13	1	7.69	7.49	2.73	(0.07, 15.17)	
Slachman, Frank N.	Surgeon Overall	398	267	7	2.62	2.25	3.09	(1.24, 6.35)	
	Mercy General Hospital	206	135	3	2.22	2.16	2.73	(0.56, 7.97)	
	Mercy San Juan Hospital	192	132	4	3.03	2.35	3.43	(0.93, 8.76)	
Smith, Larry H.	Surgeon Overall	56	49	2	4.08	2.24	4.83	(0.58, 17.43)	
	Santa Rosa Memorial Hospital	56	49	2	4.08	2.24	4.83	(0.58, 17.43)	

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State of California†		41,256	32,586	865	2.65				
Soltero, Michael J.	Surgeon Overall	173	119	2	1.68	2.92	1.53	(0.18, 5.51)	
	Encino Tarzana Regional Medical Center - Tarzana	6	3	0	0.00	2.06	0.00	(0.00, 100.0)	
	Northridge Hospital Medical Center	81	55	1	1.82	3.44	1.40	(0.04, 7.81)	
	Providence Holy Cross Medical Center	74	51	1	1.96	2.55	2.05	(0.05, 11.38)	
	West Hills Regional Medical Center	12	10	0	0.00	2.24	0.00	(0.00, 43.56)	
Sommerhaug, Rolf G.#	Surgeon Overall	145	111	2	1.80	2.23	2.14	(0.26, 7.72)	
	John Muir Medical Center - Walnut Creek Campus	6	6	0	0.00	2.05	0.00	(0.00, 79.45)	
	John Muir Medical Center - Concord Campus	139	105	2	1.90	2.24	2.25	(0.27, 8.13)	
Soto-Velasco, Jose M.	Surgeon Overall	1	1	0	0.00	1.58	0.00	(0.00, 100.0)	
	Bakersfield Memorial Hospital	1	1	0	0.00	1.58	0.00	(0.00, 100.0)	
Spowart, Gregory S.	Surgeon Overall	193	167	2	1.20	1.80	1.77	(0.21, 6.37)	
	Salinas Valley Memorial Hospital	193	167	2	1.20	1.80	1.77	(0.21, 6.37)	
Stahl, Richard D.	Surgeon Overall	212	168	5	2.98	3.51	2.25	(0.73, 5.24)	
	Scripps Memorial Hospital - La Jolla	212	168	5	2.98	3.51	2.25	(0.73, 5.24)	
Stanten, Russell D.	Surgeon Overall	160	127	2	1.57	2.60	1.61	(0.19, 5.81)	
	Alta Bates Summit Medical Center - Summit Campus	126	99	1	1.01	2.48	1.08	(0.03, 6.01)	
	Doctors Medical Center - San Pablo Campus	34	28	1	3.57	3.00	3.16	(0.08, 17.57)	
Starnes, Vaughn A.	Surgeon Overall	208	98	0	0.00	2.10	0.00	(0.00, 4.76)	
	Huntington Memorial Hospital	53	29	0	0.00	3.53	0.00	(0.00, 9.56)	
	Methodist Hospital of Southern California	1	1	0	0.00	1.05	0.00	(0.00, 100.0)	
	USC University Hospital	153	67	0	0.00	1.50	0.00	(0.00, 9.74)	
	White Memorial Medical Center	1	1	0	0.00	1.71	0.00	(0.00, 100.0)	

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Surgeon passed away and was unable to review the outcome results presented in this report.

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State of California†		41,256	32,586	865	2.65				
Stefanacci, Paul R.	Surgeon Overall	210	194	5	2.58	2.52	2.72	(0.88, 6.33)	
	Community Medical Center – Fresno	1	1	0	0.00	2.48	0.00	(0.00, 100.0)	
	Fresno Heart Hospital	9	9	0	0.00	1.15	0.00	(0.00, 94.73)	
	St. Agnes Medical Center	200	184	5	2.72	2.59	2.79	(0.90, 6.50)	
Stein, Alexander G.	Surgeon Overall	146	125	5	4.00	5.16	2.06	(0.67, 4.80)	
	Lakewood Regional Medical Center	3	2	0	0.00	3.48	0.00	(0.00, 100.0)	
	Little Company of Mary Hospital	1	1	1	100.00	9.22	28.79	(0.73, 100.0)	
	Long Beach Memorial Medical Center	1	1	0	0.00	14.97	0.00	(0.00, 65.29)	
	Los Angeles Co. Harbor - UCLA Medical Center	6	6	0	0.00	7.70	0.00	(0.00, 21.15)	
	St. Mary Medical Center	135	115	4	3.48	4.93	1.87	(0.51, 4.78)	
	Surgeon Overall	1	1	0	0.00	2.04	0.00	(0.00, 100.0)	
Sterling-Scott, Rosalyn P.	Brotman Medical Center	1	1	0	0.00	2.04	0.00	(0.00, 100.0)	
	Surgeon Overall	229	194	5	2.58	3.11	2.20	(0.71, 5.12)	
Stewart, Robert D.	Community Medical Center - Fresno	36	31	0	0.00	3.77	0.00	(0.00, 8.36)	
	Dominican Hospital	3	2	0	0.00	1.11	0.00	(0.00, 100.0)	
	Fresno Heart Hospital	29	22	0	0.00	1.95	0.00	(0.00, 22.84)	
	San Antonio Community Hospital	7	7	0	0.00	2.41	0.00	(0.00, 57.88)	
	St. Agnes Medical Center	154	132	5	3.79	3.22	3.13	(1.01, 7.28)	
	Surgeon Overall	140	80	3	3.75	2.18	4.56	(0.94, 13.31)	
Stoneburner, John M.	Little Company of Mary Hospital	37	22	2	9.09	2.54	9.50	(1.15, 34.25)	
	Torrance Memorial Medical Center	103	58	1	1.72	2.05	2.24	(0.06, 12.44)	
	Surgeon Overall	124	89	1	1.12	1.93	1.54	(0.04, 8.58)	
Suda, Richard W.	Glendale Adventist Medical Center - Wilson Terrace	7	7	0	0.00	1.66	0.00	(0.00, 84.14)	

*A surgeon is classified as “Better” if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as “Worse” if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon’s performance is considered “Not Different” from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Suda, Richard W.	Glendale Memorial Hospital and Health Center	117	82	1	1.22	1.96	1.65	(0.04, 9.20)	
Sweezer, William P.	Surgeon Overall	64	50	3	6.00	2.93	5.43	(1.12, 15.84)	
	John Muir Medical Center - Walnut Creek Campus	1	1	0	0.00	2.22	0.00	(0.00, 100.0)	
	John Muir Medical Center - Concord Campus	63	49	3	6.12	2.95	5.51	(1.14, 16.09)	
Talieh, Yahya J.	Surgeon Overall	89	68	1	1.47	2.57	1.52	(0.04, 8.46)	
	Doctors Medical Center - Modesto Campus	4	3	0	0.00	1.53	0.00	(0.00, 100.0)	
	Memorial Medical Center of Modesto	85	65	1	1.54	2.61	1.56	(0.04, 8.69)	
Tang, Eddie	Surgeon Overall	41	30	4	13.33	5.60	6.32	(1.72, 16.16)	
	California Pacific Medical Center - Pacific Campus	3	3	1	33.33	25.54	3.46	(0.09, 19.27)	
	St. Mary's Medical Center, San Francisco	38	27	3	11.11	3.38	8.72	(1.79, 25.43)	
Tedesco, Dominic J.	Surgeon Overall	147	118	2	1.69	2.84	1.58	(0.19, 5.71)	
	Community Memorial Hospital of San Buenaventura	147	118	2	1.69	2.84	1.58	(0.19, 5.71)	
Thibault, William N.	Surgeon Overall	227	209	4	1.91	2.06	2.47	(0.67, 6.31)	
	Mission Hospital Regional Medical Center	211	195	4	2.05	2.09	2.60	(0.71, 6.65)	
	Saddleback Memorial Medical Center	15	13	0	0.00	1.63	0.00	(0.00, 46.16)	
	Western Medical Center - Santa Ana	1	1	0	0.00	1.34	0.00	(0.00, 100.0)	
Thistlethwaite, Patricia A.	Surgeon Overall	26	21	1	4.76	1.59	7.96	(0.20, 44.26)	
	UCSD Medical Center	21	19	1	5.26	1.42	9.86	(0.25, 54.87)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Thistlethwaite, Patricia A.	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	5	2	0	0.00	3.23	0.00	(0.00, 100.0)	
Tobin, Hugh M.	Surgeon Overall	84	71	6	8.45	2.89	7.75	(2.84, 16.85)	Worse
	Doctors Medical Center - Modesto Campus	79	66	5	7.58	2.78	7.24	(2.35, 16.87)	
	Shasta Regional Medical Center	5	5	1	20.00	4.41	12.04	(0.30, 66.97)	
Toporoff, Bruce M.	Surgeon Overall	136	116	2	1.72	3.82	1.20	(0.14, 4.32)	
	Los Robles Regional Medical Center	11	11	0	0.00	1.75	0.00	(0.00, 50.75)	
	St. John's Regional Medical Center	125	105	2	1.90	4.04	1.25	(0.15, 4.51)	
Tovar, Eduardo A.	Surgeon Overall	301	248	3	1.21	2.85	1.12	(0.23, 3.28)	
	Presbyterian Intercommunity Hospital	177	148	1	0.68	2.87	0.62	(0.02, 3.48)	
	St. Jude Medical Center	124	100	2	2.00	2.83	1.88	(0.23, 6.76)	
Trento, Alfredo	Surgeon Overall	165	92	1	1.09	1.85	1.56	(0.04, 8.66)	
	Cedars Sinai Medical Center	165	92	1	1.09	1.85	1.56	(0.04, 8.66)	
Trivedi, Rohitkumar R.	Surgeon Overall	247	214	3	1.40	2.96	1.26	(0.26, 3.66)	
	Pomona Valley Hospital Medical Center	247	214	3	1.40	2.96	1.26	(0.26, 3.66)	
Tseng, Elaine E.	Surgeon Overall	17	13	0	0.00	3.44	0.00	(0.00, 21.83)	
	UCSF Medical Center	17	13	0	0.00	3.44	0.00	(0.00, 21.83)	
Tyner, John J.	Surgeon Overall	137	90	1	1.11	2.09	1.41	(0.04, 7.87)	
	Scripps Green Hospital	117	76	1	1.32	2.11	1.65	(0.04, 9.19)	
	Scripps Mercy Hospital	20	14	0	0.00	1.93	0.00	(0.00, 36.12)	
Tzeng, Thomas S.	Surgeon Overall	166	147	8	5.44	3.33	4.34	(1.87, 8.55)	
	Anaheim Memorial Medical Center	1	0	.	.	.	.		Not Applicable
	Downey Regional Medical Center	105	96	6	6.25	3.00	5.53	(2.02, 12.01)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Tzeng, Thomas S.	Presbyterian Intercommunity Hospital	54	46	2	4.35	4.24	2.72	(0.33, 9.82)	
	West Anaheim Medical Center	6	5	0	0.00	1.15	0.00	(0.00, 100.0)	
Vazquez, Demetrio J.	Surgeon Overall	104	79	1	1.27	4.02	0.84	(0.02, 4.65)	
	Scripps Memorial Hospital - La Jolla	104	79	1	1.27	4.02	0.84	(0.02, 4.65)	
Vial, Conrad M.	Surgeon Overall	11	8	0	0.00	1.32	0.00	(0.00, 92.70)	
	Sequoia Hospital	11	8	0	0.00	1.32	0.00	(0.00, 92.70)	
Vunnamadala, Syam P.	Surgeon Overall	88	75	2	2.67	3.69	1.92	(0.23, 6.92)	
	Anaheim Memorial Medical Center	53	45	1	2.22	2.89	2.04	(0.05, 11.35)	
	St. Jude Medical Center	1	1	0	0.00	0.48	0.00	(0.00, 100.0)	
	West Anaheim Medical Center	14	14	1	7.14	9.37	2.02	(0.05, 11.26)	
	Western Medical Center Hospital - Anaheim	20	15	0	0.00	0.99	0.00	(0.00, 65.50)	
Wallace, Douglas C.	Surgeon Overall	4	2	0	0.00	0.50	0.00	(0.00, 100.0)	
	UCSD Medical Center	4	2	0	0.00	0.50	0.00	(0.00, 100.0)	
Wang, Nan	Surgeon Overall	298	202	1	0.50	2.31	0.57	(0.01, 3.17)	
	Loma Linda University Medical Center	259	170	1	0.59	2.22	0.70	(0.02, 3.92)	
	Riverside Community Hospital	16	14	0	0.00	2.82	0.00	(0.00, 24.80)	
	San Antonio Community Hospital	23	18	0	0.00	2.80	0.00	(0.00, 19.41)	
	Surgeon Overall	197	145	2	1.38	2.98	1.23	(0.15, 4.43)	
West, Phillip N.	Surgeon Overall	197	145	2	1.38	2.98	1.23	(0.15, 4.43)	
	Santa Barbara Cottage Hospital	197	145	2	1.38	2.98	1.23	(0.15, 4.43)	
Westerman, G. Richard	Surgeon Overall	222	158	8	5.06	3.93	3.42	(1.48, 6.73)	
	Santa Barbara Cottage Hospital	222	158	8	5.06	3.93	3.42	(1.48, 6.73)	
Wilson, Joseph W.	Surgeon Overall	197	152	4	2.63	2.46	2.84	(0.77, 7.25)	
	Desert Regional Medical Center	1	1	0	0.00	0.81	0.00	(0.00, 100.0)	
	Eisenhower Memorial Hospital	196	151	4	2.65	2.47	2.84	(0.77, 7.26)	
Wood, Michael K.	Surgeon Overall	38	30	0	0.00	2.89	0.00	(0.00, 11.29)	
	Peninsula Medical Center	38	30	0	0.00	2.89	0.00	(0.00, 11.29)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Wood, Michael N.	Surgeon Overall	199	175	7	4.00	3.98	2.67	(1.07, 5.48)	
	San Antonio Community Hospital	199	175	7	4.00	3.98	2.67	(1.07, 5.48)	
Yacoubian, Vahe S.	Surgeon Overall	8	8	0	0.00	2.51	0.00	(0.00, 48.66)	
	Glendale Adventist Medical Center - Wilson Terrace	8	8	0	0.00	2.51	0.00	(0.00, 48.66)	
Yap, Alexander G.	Surgeon Overall	251	241	14	5.81	3.41	4.53	(2.47, 7.58)	
	Seton Medical Center	248	239	14	5.86	3.43	4.53	(2.48, 7.60)	
	St. Mary's Medical Center, San Francisco	3	2	0	0.00	0.74	0.00	(0.00, 100.0)	
Yasuda, Roderick K.	Surgeon Overall	158	133	3	2.26	2.84	2.11	(0.43, 6.15)	
	Northridge Hospital Medical Center	56	48	3	6.25	3.82	4.34	(0.89, 12.67)	
	Providence Holy Cross Medical Center	80	65	0	0.00	2.03	0.00	(0.00, 7.40)	
	West Hills Regional Medical Center	22	20	0	0.00	3.11	0.00	(0.00, 15.71)	
Yee, Edward S.	Surgeon Overall	3	3	1	33.33	5.49	16.12	(0.41, 89.64)	
	California Pacific Medical Center - Pacific Campus	1	1	0	0.00	1.22	0.00	(0.00, 100.0)	
	Marin General Hospital	2	2	1	50.00	7.63	17.40	(0.44, 96.81)	
Yokoyama, Taro	Surgeon Overall	312	261	10	3.83	2.67	3.82	(1.83, 7.01)	
	Centinela Hospital Medical Center	99	82	1	1.22	2.20	1.47	(0.04, 8.17)	
	Good Samaritan Hospital - Los Angeles	63	49	3	6.12	2.87	5.66	(1.16, 16.51)	
	Providence St. Joseph Medical Center	30	22	1	4.55	2.27	5.33	(0.13, 29.62)	
	St. Vincent Medical Center	120	108	5	4.63	3.00	4.09	(1.33, 9.54)	
Young, John A.	Surgeon Overall	6	5	2	40.00	4.35	24.43	(2.95, 88.11)	Worse
	Tri-City Medical Center	6	5	2	40.00	4.35	24.43	(2.95, 88.11)	Worse
Young, Joseph N.	Surgeon Overall	150	97	1	1.03	1.97	1.39	(0.04, 7.75)	
	UC Davis Medical Center	150	97	1	1.03	1.97	1.39	(0.04, 7.75)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

Table 4: Surgeon Risk-Adjusted Operative Mortality Results, 2005-2006

Surgeon	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (% RAMR)	95% CI for RAMR	Performance Rating*
State of California†		41,256	32,586	865	2.65				
Yun, Kwok L.	Surgeon Overall	440	302	7	2.32	2.19	2.80	(1.13, 5.77)	
	Kaiser Foundation Hospital (Sunset)	440	302	7	2.32	2.19	2.80	(1.13, 5.77)	
Zalez, James P.	Surgeon Overall	10	9	0	0.00	2.15	0.00	(0.00, 50.59)	
	St. John's Hospital and Health Center	10	9	0	0.00	2.15	0.00	(0.00, 50.59)	
Zapolanski, Alex	Surgeon Overall	140	97	3	3.09	2.22	3.70	(0.76, 10.80)	
	California Pacific Medical Center - Pacific Campus	47	34	1	2.94	2.72	2.87	(0.07, 15.95)	
	Peninsula Medical Center	35	15	1	6.67	2.98	5.94	(0.15, 33.03)	
	Seton Medical Center	58	48	1	2.08	1.62	3.41	(0.09, 18.96)	
Zhu, Henry L.	Surgeon Overall	42	42	3	7.14	2.74	6.92	(1.42, 20.18)	
	California Pacific Medical Center - Pacific Campus	26	26	2	7.69	3.13	6.53	(0.79, 23.54)	
	Marin General Hospital	16	16	1	6.25	2.11	7.85	(0.20, 43.67)	
Zusman, Douglas R.	Surgeon Overall	177	134	0	0.00	1.97	0.00	(0.00, 3.71)	
	Hoag Memorial Hospital Presbyterian	177	134	0	0.00	1.97	0.00	(0.00, 3.71)	

*A surgeon is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A surgeon is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A surgeon's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

† For eight cases, the responsible surgeon could not be determined. As a result of the surgeon statement process these cases have been removed from Table 4 for surgeon results, however, these cases remain in Table 3 and Table 5 for hospital results.

2005-2006 Hospital Risk-Adjusted Operative Mortality Results

Table 5 presents the risk-adjusted results for each hospital for 2005-2006 combined. The table is sorted by geographic region and contains, for each hospital, the total number of CABG surgeries performed (isolated and non-isolated combined), the number of isolated CABG surgeries, the number of observed isolated CABG deaths, the observed mortality rate, the expected mortality rate predicted by the risk model, the RAMR and the 95% CI of the RAMR, and the associated hospital performance rating.

Among the 32,586 isolated CABG surgeries performed in 2005-2006, 865 patients died in-hospital or within 30 days of the surgery date, reflecting an overall operative mortality rate of 2.65% in California. The observed mortality rates among hospitals ranged from 0% to 8.41%. The expected mortality rates, which are generated by the model and measure patient severity of illness, were between 1.30% and 9.01%. The risk-adjusted mortality rates, which measure hospital performance, ranged from 0% to 10.77%.

Based on the 95% confidence intervals for risk-adjusted mortality rates, 115 of 121 hospitals (95%) performed within the expected range compared to the state's overall mortality rate (performance rating is blank), no hospital performed significantly "**Better**" than the state average, and 6 hospitals performed significantly "**Worse**" than the state average. The hospitals marked with two asterisks (**) in Table 5 submitted statements regarding this report. Those letters are presented in Appendix A.

Table 5: Hospital Risk-Adjusted Operative Mortality Results by Region, 2005-2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
Sacramento Valley & Northern California Region	Enloe Medical Center	421	315	11	3.49	3.45	2.69	(1.34, 4.80)	
	Mercy General Hospital	1,953	1,300	16	1.23	1.60	2.05	(1.17, 3.32)	
	Mercy Medical Center - Redding	391	308	5	1.62	3.06	1.41	(0.46, 3.28)	
	Mercy San Juan Hospital	268	192	5	2.60	2.38	2.90	(0.94, 6.76)	
	Rideout Memorial Hospital	324	227	6	2.64	2.61	2.69	(0.98, 5.84)	
	Shasta Regional Medical Center	181	153	3	1.96	3.63	1.43	(0.29, 4.18)	
	St. Joseph Hospital - Eureka	149	117	4	3.42	2.65	3.43	(0.93, 8.77)	
	Sutter Memorial Hospital	999	736	17	2.31	2.35	2.60	(1.52, 4.18)	
	UC Davis Medical Center	345	238	3	1.26	2.05	1.63	(0.34, 4.75)	
San Francisco Bay Area & San Jose	Alta Bates Summit Medical Center - Summit Campus	1,557	1,268	24	1.89	2.44	2.06	(1.32, 3.05)	
	California Pacific Medical Center - Pacific Campus	231	164	8	4.88	3.22	4.02	(1.73, 7.91)	
	Doctors Medical Center - San Pablo Campus	69	59	1	1.69	4.19	1.07	(0.03, 5.98)	
	Dominican Hospital	186	159	4	2.52	3.36	1.99	(0.54, 5.08)	
	El Camino Hospital	170	126	0	0.00	1.56	0.00	(0.00, 4.98)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

Table 5: Hospital Risk-Adjusted Operative Mortality Results by Region, 2005-2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
	Good Samaritan Hospital - San Jose	366	290	9	3.10	3.06	2.69	(1.23, 5.10)	
	John Muir Medical Center - Concord Campus	498	411	8	1.95	2.41	2.14	(0.92, 4.22)	
	John Muir Medical Center - Walnut Creek Campus	23	21	1	4.76	6.20	2.04	(0.05, 11.34)	
	Kaiser Foundation Hospital (Geary San Francisco)	1,391	1,027	12	1.17	1.78	1.74	(0.90, 3.03)	
	Marin General Hospital	140	113	2	1.77	2.60	1.81	(0.22, 6.52)	
	O'Connor Hospital	196	166	7	4.22	2.22	5.04	(2.02, 10.36)	
	Peninsula Medical Center	102	67	2	2.99	3.93	2.02	(0.24, 7.28)	
	Queen of the Valley Hospital	463	393	11	2.80	3.36	2.21	(1.10, 3.95)	
	Regional Medical of San Jose	25	23	0	0.00	1.92	0.00	(0.00, 22.18)	
	Salinas Valley Memorial Hospital	318	276	3	1.09	1.96	1.47	(0.30, 4.30)	
	San Ramon Regional Medical Center	138	116	1	0.86	1.90	1.20	(0.03, 6.68)	
	Santa Clara Valley Medical Center	114	104	1	0.96	1.30	1.96	(0.05, 10.88)	
	Santa Rosa Memorial Hospital	131	108	2	1.85	2.14	2.29	(0.28, 8.27)	
	Sequoia Hospital	516	291	7	2.41	2.44	2.62	(1.05, 5.38)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

Table 5: Hospital Risk-Adjusted Operative Mortality Results by Region, 2005-2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
	Seton Medical Center	515	463	17	3.67	2.84	3.44	(2.00, 5.49)	
	St. Helena Hospital	229	207	10	4.83	4.23	3.03	(1.45, 5.57)	
	St. Mary's Medical Center, San Francisco	85	61	3	4.92	2.61	5.00	(1.03, 14.59)	
	Stanford University Hospital	372	248	6	2.42	2.55	2.52	(0.92, 5.47)	
	Sutter Medical Center of Santa Rosa	255	180	4	2.22	2.08	2.84	(0.77, 7.25)	
	UCSF Medical Center	285	240	4	1.67	2.81	1.57	(0.43, 4.02)	
	Valleycare Medical Center	17	15	1	6.67	9.01	1.96	(0.05, 10.92)	
	Washington Hospital – Fremont**	280	234	13	5.56	2.86	5.15	(2.74, 8.79)	Worse
Central California									
	Bakersfield Heart Hospital	429	348	13	3.74	2.15	4.61	(2.45, 7.88)	
	Bakersfield Memorial Hospital	408	351	12	3.42	1.92	4.72	(2.44, 8.24)	
	Community Medical Center - Fresno	336	295	11	3.73	3.32	2.98	(1.49, 5.33)	
	Dameron Hospital	98	89	6	6.74	2.56	7.00	(2.56, 15.20)	
	Doctors Medical Center - Modesto Campus	700	563	10	1.78	1.89	2.49	(1.19, 4.57)	
	Fresno Heart Hospital	473	391	6	1.53	2.13	1.91	(0.70, 4.15)	

*A hospital is classified as “Better” if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as “Worse” if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital’s performance is considered “Not Different” from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

** Appendix A includes this hospital’s statement regarding the report.

Table 5: Hospital Risk-Adjusted Operative Mortality Results by Region, 2005-2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
	Kaweah Delta Hospital	629	529	20	3.78	3.21	3.12	(1.91, 4.82)	
	Marian Medical Center	238	196	9	4.59	2.86	4.26	(1.94, 8.07)	
	Memorial Medical Center of Modesto	628	514	14	2.72	2.36	3.07	(1.67, 5.14)	
	San Joaquin Community Hospital	149	137	8	5.84	2.31	6.72	(2.89, 13.21)	Worse
	St. Agnes Medical Center	756	663	19	2.87	2.60	2.92	(1.76, 4.55)	
	St. Joseph's Medical Center of Stockton	511	453	14	3.09	2.60	3.15	(1.72, 5.28)	
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara	Antelope Valley Hospital Medical Center	91	80	3	3.75	1.38	7.22	(1.49, 21.07)	
	Community Memorial Hospital of San Buenaventura	261	219	4	1.83	3.34	1.45	(0.39, 3.71)	
	Encino Tarzana Regional Medical Center - Tarzana	246	193	1	0.52	2.72	0.51	(0.01, 2.82)	
	French Hospital Medical Center	252	175	1	0.57	1.86	0.81	(0.02, 4.53)	
	Glendale Adventist Medical Center - Wilson Terrace	281	246	4	1.63	2.27	1.90	(0.52, 4.86)	
	Glendale Memorial Hospital and Health Center	290	227	8	3.52	2.80	3.34	(1.44, 6.58)	
	Lancaster Community Hospital	18	18	0	0.00	2.31	0.00	(0.00, 23.47)	
	Los Robles Regional Medical Center	258	202	4	1.98	3.41	1.54	(0.42, 3.94)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

Table 5: Hospital Risk-Adjusted Operative Mortality Results by Region, 2005-2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
	Northridge Hospital Medical Center	240	188	10	5.32	4.11	3.44	(1.65, 6.31)	
	Providence Holy Cross Medical Center	217	171	1	0.58	2.26	0.69	(0.02, 3.81)	
	Providence St. Joseph Medical Center	133	97	3	3.09	1.99	4.12	(0.85, 12.01)	
	Santa Barbara Cottage Hospital	419	303	10	3.30	3.47	2.52	(1.21, 4.63)	
	Sierra Vista Regional Medical Center	96	77	5	6.49	5.64	3.06	(0.99, 7.12)	
	St. John's Regional Medical Center	292	227	5	2.20	3.51	1.67	(0.54, 3.88)	
	Valley Presbyterian Hospital	56	50	3	6.00	1.48	10.77	(2.22, 31.41)	
	West Hills Regional Medical Center	96	86	3	3.49	3.16	2.93	(0.60, 8.54)	
Greater Los Angeles									
	Beverly Hospital	50	48	1	2.08	2.27	2.43	(0.06, 13.53)	
	Brotman Medical Center	19	12	0	0.00	2.69	0.00	(0.00, 30.23)	
	Cedars Sinai Medical Center	500	306	10	3.27	2.58	3.36	(1.61, 6.17)	
	Centinela Hospital Medical Center	187	160	4	2.50	2.84	2.33	(0.63, 5.97)	
	Citrus Valley Medical Center – IC Campus	233	184	11	5.98	2.64	6.01	(2.99, 10.73)	Worse
	Downey Regional Medical Center	180	167	6	3.59	2.29	4.16	(1.52, 9.04)	

*A hospital is classified as “Better” if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as “Worse” if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital’s performance is considered “Not Different” from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

Table 5: Hospital Risk-Adjusted Operative Mortality Results by Region, 2005-2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
	Garfield Medical Center	258	216	4	1.85	3.56	1.38	(0.38, 3.53)	
	Good Samaritan Hospital - Los Angeles	397	313	13	4.15	4.13	2.67	(1.42, 4.56)	
	Huntington Memorial Hospital	296	207	7	3.38	3.63	2.47	(0.99, 5.08)	
	Kaiser Foundation Hospital (Sunset)	2,037	1,699	36	2.12	2.52	2.23	(1.56, 3.08)	
	Lakewood Regional Medical Center	256	214	4	1.87	2.79	1.78	(0.48, 4.55)	
	Little Company of Mary Hospital	159	107	9	8.41	3.94	5.67	(2.59, 10.75)	
	Long Beach Memorial Medical Center	623	514	13	2.53	2.18	3.08	(1.64, 5.26)	
	Los Angeles Co. Harbor - UCLA Medical Center	238	209	6	2.87	2.09	3.65	(1.34, 7.94)	
	Los Angeles Co. USC Medical Center**	202	169	7	4.14	1.44	7.64	(3.07, 15.72)	Worse
	Methodist Hospital of Southern California	219	193	5	2.59	2.76	2.49	(0.81, 5.81)	
	Presbyterian Intercommunity Hospital	233	195	3	1.54	3.19	1.28	(0.26, 3.74)	
	Santa Monica - UCLA Medical Center	61	46	2	4.35	2.47	4.67	(0.56, 16.85)	
	St. Francis Medical Center	99	91	3	3.30	2.41	3.63	(0.75, 10.60)	
	St. John's Hospital and Health Center	200	163	2	1.23	2.38	1.37	(0.17, 4.93)	

*A hospital is classified as “Better” if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as “Worse” if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital’s performance is considered “Not Different” from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

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Table 5: Hospital Risk-Adjusted Operative Mortality Results by Region, 2005-2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
	St. Mary Medical Center	137	117	4	3.42	4.89	1.86	(0.50, 4.74)	
	St. Vincent Medical Center	271	237	7	2.95	3.17	2.48	(0.99, 5.09)	
	Torrance Memorial Medical Center**	298	181	12	6.63	2.89	6.10	(3.15, 10.63)	Worse
	UCLA Medical Center	300	151	2	1.32	2.98	1.17	(0.14, 4.25)	
	USC University Hospital**	308	168	3	1.79	2.92	1.62	(0.33, 4.74)	
	White Memorial Medical Center	208	190	6	3.16	2.54	3.29	(1.21, 7.16)	
Inland Empire, Riverside & San Bernardino	Desert Regional Medical Center	456	375	12	3.20	2.77	3.07	(1.58, 5.35)	
	Eisenhower Memorial Hospital	471	378	12	3.17	2.67	3.15	(1.63, 5.50)	
	Loma Linda University Medical Center	791	596	10	1.68	2.43	1.83	(0.88, 3.36)	
	Pomona Valley Hospital Medical Center	384	348	5	1.44	3.18	1.20	(0.39, 2.80)	
	Riverside Community Hospital	451	391	13	3.32	2.79	3.16	(1.68, 5.39)	
	San Antonio Community Hospital	229	200	7	3.50	3.82	2.43	(0.98, 5.00)	
	St. Bernardine Medical Center	1,011	883	29	3.28	2.95	2.96	(1.98, 4.24)	
	St. Mary Regional Medical Center	407	328	16	4.88	2.98	4.35	(2.48, 7.05)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

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Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
Orange County	Anaheim Memorial Medical Center	418	362	10	2.76	2.82	2.60	(1.24, 4.77)	
	Fountain Valley Regional Hospital	214	199	8	4.02	3.25	3.28	(1.41, 6.46)	
	Hoag Memorial Hospital Presbyterian	530	362	5	1.38	2.14	1.72	(0.56, 4.00)	
	Irvine Regional Hospital and Medical Center	68	59	0	0.00	2.38	0.00	(0.00, 6.97)	
	Mission Hospital Regional Medical Center	352	314	5	1.59	2.22	1.90	(0.62, 4.43)	
	Saddleback Memorial Medical Center	281	236	4	1.69	2.48	1.82	(0.49, 4.65)	
	St. Joseph Hospital - Orange	319	239	8	3.35	1.93	4.61	(1.99, 9.07)	
	St. Jude Medical Center	357	303	10	3.30	2.33	3.76	(1.80, 6.90)	
	UC Irvine Medical Center	150	117	2	1.71	3.18	1.43	(0.17, 5.15)	
	West Anaheim Medical Center	79	73	4	5.48	3.54	4.11	(1.12, 10.51)	
	Western Medical Center - Santa Ana	176	148	3	2.03	2.20	2.45	(0.50, 7.15)	
Western Medical Center Hospital - Anaheim	231	214	8	3.74	2.25	4.40	(1.90, 8.66)		
Greater San Diego	Alvarado Hospital Medical Center	181	155	4	2.58	2.19	3.13	(0.85, 8.00)	
	Palomar Medical Center	201	159	4	2.52	1.37	4.87	(1.32, 12.44)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

Table 5: Hospital Risk-Adjusted Operative Mortality Results by Region, 2005-2006

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Deaths	Observed Mortality Rate (%)	Expected Mortality Rate (%)	Risk-Adjusted Mortality Rate (%), RAMR)	95% CI for RAMR	Performance Rating*
State of California		41,256	32,586	865	2.65				
	Scripps Green Hospital	251	192	2	1.04	2.43	1.14	(0.14, 4.10)	
	Scripps Memorial Hospital - La Jolla	874	631	15	2.38	3.38	1.87	(1.04, 3.07)	
	Scripps Mercy Hospital	320	262	7	2.67	2.33	3.05	(1.22, 6.27)	
	Sharp Chula Vista Medical Center	417	335	14	4.18	3.53	3.15	(1.72, 5.27)	
	Sharp Grossmont Hospital	335	269	9	3.35	3.27	2.71	(1.24, 5.14)	
	Sharp Memorial Hospital	490	295	5	1.69	1.80	2.51	(0.81, 5.84)	
	Tri-City Medical Center**	251	195	8	4.10	1.57	6.92	(2.98, 13.61)	Worse
	UCSD Medical Center	120	104	4	3.85	1.66	6.15	(1.67, 15.73)	
	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	168	100	1	1.00	2.23	1.19	(0.03, 6.62)	

*A hospital is classified as "Better" if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.65). A hospital is classified as "Worse" if the lower 95% CI of the RAMR is higher than the California observed mortality rate. A hospital's performance is considered "Not Different" from the state average (rating is blank) if the California mortality rate falls within the 95% CI of the RAMR.

** Appendix A includes this hospital's statement regarding the report.

VI. 2006 INTERNAL MAMMARY ARTERY USAGE BY HOSPITAL: A PROCESS MEASURE OF QUALITY

A widely accepted definition of healthcare quality contains three dimensions: process, structure, and outcomes.¹⁰ Outcome measures, such as risk-adjusted mortality rates, provide a benchmark for comparing provider performance and can be used for investigation of internal processes and structures. However, assessing processes of care provides a more immediate path to improvement in patient care since it involves measurement of the care patients actually receive. If diagnostic and therapeutic strategies with clear links to outcomes are monitored, some healthcare quality problems can be detected long before demonstrable outcome differences occur.

In most cases of first-time isolated CABG surgery where the operative status is elective or urgent, the surgeon has the option of using the internal mammary artery (IMA), also known as the internal thoracic artery. The IMA and especially the left IMA is considered the preferred conduit for CABG surgery of the left anterior descending (LAD) coronary artery. A number of healthcare quality advocates recommend public reporting of IMA usage rates for CABG surgery.

The clinical literature strongly supports use of the IMA to promote long-term graft patency and patient survival, but recent research also suggests a reduction in immediate, operative mortality associated with use of the internal mammary artery as opposed to saphenous vein revascularization.¹¹

Currently, the Leapfrog Evidence-Based Hospital Referral program endorses 80% hospital adherence to IMA use. The National Quality Forum (NQF) does not endorse a specific rate but states that the goal is to raise the IMA usage rates of hospitals with low utilization. The Society of Thoracic Surgeons (STS) states that the IMA should be given primary consideration in every CABG surgery patient.

Table 6 provides hospital results for IMA usage for 2006. Only first-time isolated CABG surgeries where the operative status is elective or urgent are included for IMA usage computation. Three hospitals received a “**Low**” rating for 2006. A “**Low**” rating is defined as a rate that falls 2 standard deviations (0.077×1.96) below the hospital statewide average IMA usage rate of 93.27 or 78.18%. IMA usage rates above the hospital statewide average IMA usage rate was not evaluated because there is no consensus on what constitutes an optimal rate of usage. Hospitals marked with two asterisks (**) in Table 6 submitted statements regarding this report. Those letters are presented in Appendix A.

Multivariable analyses performed by CCORP also confirmed use of the IMA as an independent predictor of operative survival for first-time isolated CABG surgery patients whose status was not emergent. Adding IMA use as an independent variable into the 2005-2006 multivariable logistic regression risk model for operative mortality had a significant effect on the predicted risk of operative mortality (OR=0.709, 95% CI: 0.581-0.866, p-value=0.0007). In addition, there was a negative correlation between hospital risk-adjusted operative mortality rates and IMA usage rates (Spearman rho=-0.07, p-value=0.416) which, while not significant, points in the expected causal direction, where hospitals with lower mortality rates have higher IMA usage rates on average.

¹⁰ Donabedian A. Evaluating the Quality of Medical Care. *The Milbank Quarterly*, 2005; 83(4): 691-729.

¹¹ Ferguson TB Jr., Coombs LP, Peterson ED. Internal thoracic artery grafting in the elderly patient undergoing coronary artery bypass grafting: room for process improvement? *Journal of Thoracic and Cardiovascular Surgery* 2002; 123(5): 869-80.

GUIDE TO INTERPRETING IMA USAGE RESULTS	
Isolated CABG Surgeries	Includes only first-time isolated CABG surgeries where the operative status was elective or urgent. This number will generally be smaller than the total isolated CABG cases performed by the hospital.
IMA Usage Rate	The ratio of the number of CABG surgeries with IMA grafts (including left IMA, right IMA and bilateral IMA) and selected first-time isolated CABG cases multiplied by 100: Percent IMA use=(Number of IMA grafts used for first-time isolated CABG surgeries/Number of first-time isolated CABG cases) x 100.
Rating	A blank rating indicates that the IMA Usage Rate is acceptable. A Low rating indicates that the IMA Usage Rate for a hospital is less than 78.18%, i.e., two standard deviations (0.077 X 1.96) below the hospital statewide average IMA usage rate (93.27%). IMA usage rates above the hospital statewide average IMA usage rate was not evaluated because there is no consensus on what constitutes an optimal rate of usage.

Table 6: Hospital Results for Usage of the Internal Mammary Artery by Region, 2006

Region	Hospital	Isolated CABG Surgeries*	IMA Usage Rate	Rating [#]
State of California		14,221	93.27%	
Sacramento Valley & Northern California Region	Enloe Medical Center	144	97.22%	
	Mercy General Hospital	601	96.84%	
	Mercy Medical Center - Redding	121	99.17%	
	Mercy San Juan Hospital	75	94.67%	
	Rideout Memorial Hospital	95	97.89%	
	Shasta Regional Medical Center	70	91.43%	
	St. Joseph Hospital - Eureka	48	93.75%	
	Sutter Memorial Hospital	315	94.29%	
	UC Davis Medical Center	116	95.69%	
San Francisco Bay Area & San Jose†	Alta Bates Summit Medical Center - Summit Campus	560	97.86%	
	California Pacific Medical Center - Pacific Campus	77	94.81%	
	Doctors Medical Center - San Pablo Campus	16	87.50%	
	Dominican Hospital	69	94.20%	
	El Camino Hospital	56	98.21%	
	Good Samaritan Hospital - San Jose	113	98.23%	
	John Muir Medical Center – Concord Campus	182	89.56%	
	Kaiser Foundation Hospital (Geary San Francisco)	489	95.30%	
	Marin General Hospital	53	100.00%	
	O'Connor Hospital	67	97.01%	
	Peninsula Medical Center	19	94.74%	
	Queen of the Valley Hospital	194	97.42%	
	Regional Medical of San Jose	15	100.00%	
	Salinas Valley Memorial Hospital	106	96.23%	
	San Ramon Regional Medical Center	51	96.08%	
	Santa Clara Valley Medical Center	44	95.45%	
Santa Rosa Memorial Hospital	42	88.10%		
Sequoia Hospital	150	98.00%		
Seton Medical Center	201	96.02%		

* Includes first-time isolated CABGs where the operative status was elective or urgent.

Low rating: IMA Usage Rate for a hospital is less than 78.18%, i.e., two standard deviations (0.077 x 1.96) below the hospital statewide average IMA usage rate (93.27%).

† John Muir Medical Center - Walnut Creek Campus performed 2 isolated CABGs in 2006, but neither met the IMA criteria for inclusion in this report.

Table 6: Hospital Results for Usage of the Internal Mammary Artery by Region, 2006

Region	Hospital	Isolated CABG Surgeries*	IMA Usage Rate	Rating [#]
State of California		14,221	93.27%	
	St. Helena Hospital	76	89.47%	
	St. Mary's Medical Center, San Francisco	25	100.00%	
	Stanford University Hospital	120	96.67%	
	Sutter Medical Center of Santa Rosa	90	73.33%	Low
	UCSF Medical Center	119	94.96%	
	Valleycare Medical Center	12	100.00%	
	Washington Hospital – Fremont**	106	94.34%	
Central California				
	Bakersfield Heart Hospital	167	91.02%	
	Bakersfield Memorial Hospital	131	94.66%	
	Community Medical Center - Fresno	124	87.10%	
	Dameron Hospital	35	94.29%	
	Doctors Medical Center - Modesto Campus	271	94.46%	
	Fresno Heart Hospital	150	96.00%	
	Kaweah Delta Hospital	229	98.25%	
	Marian Medical Center	78	97.44%	
	Memorial Medical Center of Modesto	230	92.17%	
	San Joaquin Community Hospital	62	90.32%	
	St. Agnes Medical Center	321	91.90%	
	St. Joseph's Medical Center of Stockton	198	94.44%	
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara				
	Antelope Valley Hospital Medical Center	39	82.05%	
	Community Memorial Hospital of San Buenaventura	88	97.73%	
	Encino Tarzana Regional Medical Center - Tarzana	79	93.67%	
	French Hospital Medical Center	79	100.00%	
	Glendale Adventist Medical Center - Wilson Terrace	110	95.45%	
	Glendale Memorial Hospital and Health Center	104	90.38%	
	Lancaster Community Hospital	3	33.33%	Low
	Los Robles Regional Medical Center	89	98.88%	

* Includes first-time isolated CABGs where the operative status was elective or urgent.

Low rating: IMA Usage Rate for a hospital is less than 78.18%, i.e., two standard deviations (0.077 x 1.96) below the hospital statewide average IMA usage rate (93.27%).

74 ** Appendix A includes this hospital's statement regarding the report.

Table 6: Hospital Results for Usage of the Internal Mammary Artery by Region, 2006

Region	Hospital	Isolated CABG Surgeries*	IMA Usage Rate	Rating [#]
State of California		14,221	93.27%	
	Northridge Hospital Medical Center	74	98.65%	
	Providence Holy Cross Medical Center	64	96.88%	
	Providence St. Joseph Medical Center	40	100.00%	
	Santa Barbara Cottage Hospital	146	94.52%	
	Sierra Vista Regional Medical Center	20	100.00%	
	St. John's Regional Medical Center	95	94.74%	
	Valley Presbyterian Hospital	30	90.00%	
	West Hills Regional Medical Center	40	97.50%	
Greater Los Angeles	Beverly Hospital	25	96.00%	
	Brotman Medical Center	4	100.00%	
	Cedars Sinai Medical Center	146	100.00%	
	Centinela Hospital Medical Center	68	92.65%	
	Citrus Valley Medical Center – IC Campus	60	83.33%	
	Downey Regional Medical Center	83	86.75%	
	Garfield Medical Center	86	82.56%	
	Good Samaritan Hospital - Los Angeles	133	96.24%	
	Huntington Memorial Hospital	79	91.14%	
	Kaiser Foundation Hospital (Sunset)	772	94.82%	
	Lakewood Regional Medical Center	88	87.50%	
	Little Company of Mary Hospital	45	97.78%	
	Long Beach Memorial Medical Center	243	91.36%	
	Los Angeles Co. Harbor - UCLA Medical Center	84	92.86%	
	Los Angeles Co. USC Medical Center**	73	91.78%	
	Methodist Hospital of Southern California	79	98.73%	
	Presbyterian Intercommunity Hospital	99	86.87%	
	Santa Monica - UCLA Medical Center	16	100.00%	
	St. Francis Medical Center	46	91.30%	
	St. John's Hospital and Health Center	78	96.15%	
	St. Mary Medical Center	49	87.76%	
	St. Vincent Medical Center	104	96.15%	

* Includes first-time isolated CABGs where the operative status was elective or urgent.

Low rating: IMA Usage Rate for a hospital is less than 78.18%, i.e., two standard deviations (0.077 x 1.96) below the hospital statewide average IMA usage rate (93.27%).

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Table 6: Hospital Results for Usage of the Internal Mammary Artery by Region, 2006

Region	Hospital	Isolated CABG Surgeries*	IMA Usage Rate	Rating [#]
State of California		14,221	93.27%	
	Torrance Memorial Medical Center**	74	97.30%	
	UCLA Medical Center	59	94.92%	
	USC University Hospital**	83	75.90%	Low
	White Memorial Medical Center	68	79.41%	
Inland Empire, Riverside & San Bernardino				
	Desert Regional Medical Center	148	96.62%	
	Eisenhower Memorial Hospital	188	92.02%	
	Loma Linda University Medical Center	254	92.52%	
	Pomona Valley Hospital Medical Center	159	94.34%	
	Riverside Community Hospital	149	87.25%	
	San Antonio Community Hospital	106	83.96%	
	St. Bernardine Medical Center	365	92.88%	
	St. Mary Regional Medical Center	126	95.24%	
Orange County				
	Anaheim Memorial Medical Center	171	89.47%	
	Fountain Valley Regional Hospital	80	95.00%	
	Hoag Memorial Hospital Presbyterian	138	98.55%	
	Irvine Regional Hospital and Medical Center	24	79.17%	
	Mission Hospital Regional Medical Center	125	97.60%	
	Saddleback Memorial Medical Center	111	99.10%	
	St. Joseph Hospital - Orange	103	97.09%	
	St. Jude Medical Center	131	96.18%	
	UC Irvine Medical Center	50	90.00%	
	West Anaheim Medical Center	36	88.89%	
	Western Medical Center - Santa Ana	55	90.91%	
	Western Medical Center Hospital – Anaheim	83	91.57%	
Greater San Diego				
	Alvarado Hospital Medical Center	58	100.00%	
	Palomar Medical Center	68	89.71%	
	Scripps Green Hospital	90	100.00%	
	Scripps Memorial Hospital - La Jolla	277	93.50%	
	Scripps Mercy Hospital	119	100.00%	
	Sharp Chula Vista Medical Center	148	96.62%	

* Includes first-time isolated CABGs where the operative status was elective or urgent.

Low rating: IMA Usage Rate for a hospital is less than 78.18%, i.e., two standard deviations (0.077 x 1.96) below the hospital statewide average IMA usage rate (93.27%).

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Region	Hospital	Isolated CABG Surgeries*	IMA Usage Rate	Rating [#]
State of California		14,221	93.27%	
	Sharp Grossmont Hospital	103	100.00%	
	Sharp Memorial Hospital	120	90.83%	
	Tri-City Medical Center**	80	81.25%	
	UCSD Medical Center	36	100.00%	
	UCSD Medical Center - La Jolla, John M. & Sally B. Thornton Hospital	43	93.02%	

* Includes first-time isolated CABGs where the operative status was elective or urgent.

[#]Low rating: IMA Usage Rate for a hospital is less than 78.18%, i.e., two standard deviations (0.077 x 1.96) below the hospital statewide average IMA usage rate (93.27%).

** Appendix A includes this hospital's statement regarding the report.

VII. THE RELATIONSHIP BETWEEN CORONARY ARTERY BYPASS GRAFT SURGERY VOLUME AND OUTCOMES

The “volume-outcome” association refers to the relationship between the quantity of care (number of patients) that a hospital or physician provides and the quality of care that patients receive. In general, researchers have found that the higher the number of patients a hospital or physician treats with a specific condition, the better, on average, patients’ health outcomes. This volume-outcome relationship has been extensively studied for patients receiving coronary artery bypass graft (CABG) surgery. While most studies have found that hospitals and surgeons performing more CABG surgeries have better outcomes, more recent research is less indicative of a clinically relevant relationship.^{12,13,14,15} Further, in recent CCORP reports, no relationship was found between hospital CABG surgery volume and risk-adjusted CABG hospital mortality.^{16,17} This is possibly because CABG surgery mortality has declined in recent years and the procedure has become more standardized given evidence-based pathways. Another possible explanation is that cumulative experience may be more important than recent experience for a mature technology such as CABG surgery.

2005-2006 Volume-Outcome Analyses

The following analyses were conducted to examine the hospital and surgeon volume-outcome relationship for CABG surgery using the combined CCORP data from 2005 and 2006. The primary goal of these analyses was to use the most current methodological techniques to determine whether hospitals and surgeons performing more procedures have lower risk-adjusted operative mortality than hospitals and surgeons performing fewer procedures in California.

To accomplish this, a patient-level, risk-adjusted mortality prediction model was first developed using a hierarchical or multi-level technique. Hierarchical models are increasingly used in health services research to analyze multi-level data, particularly when analyses are intended to assess the impact of hospitals or surgeon CABG volume on patient-level outcomes. All of the independent variables included in the patient-level risk adjustment model were included in the hospital and surgeon analyses.

¹² Peterson ED, Coombs LP, DeLong ER, Haan CK, Ferguson TB. Procedural volume as a marker of quality for CABG surgery. *Journal of the American Medical Association*. 2004;291(2):195-201.

¹³ Shahian DM, Normand SL, Torchiana DF, Lewis SM, Pastore JO, Kuntz RE, et al. Cardiac surgery report cards: comprehensive review and statistical critique. *Annals of Thoracic Surgery*. 2001;72(6):2155-68.

¹⁴ Glance LG, Dick AW, Mukamel DB, Osler TM. Is the hospital volume-mortality relationship in coronary artery bypass surgery the same for low-risk versus high-risk patients? *Annals of Thoracic Surgery*. 2003;76(4):1155-62.

¹⁵ Marcin JP, Li Z, Kravitz RL, Dai JJ, Rocke DM, Romano PS. The CABG surgery volume-outcome relationship: temporal trends and selection effects in California, 1998-2004. *Health Services Research*. 2008; 43(1):174-92.

¹⁶ California Office of Statewide Health Planning and Development. ***The California Report on Coronary Artery Bypass Graft Surgery 2003-04 Hospital and Surgeon Data***, Sacramento, CA: California Office of Statewide Health Planning and Development, March 2007.

¹⁷ California Office of Statewide Health Planning and Development. ***The California Report on Coronary Artery Bypass Graft Surgery 2005 Hospital Data***, Sacramento, CA: California Office of Statewide Health Planning and Development, December 2007.

Two definitions of volume were considered for both the hospital and surgeon volume-outcome analyses. First, “isolated CABG volume” was analyzed to assess whether there was an association between isolated CABG volume and isolated CABG mortality. Second, “total CABG volume,” which includes both isolated and non-isolated CABG surgeries, was analyzed to assess whether there was an association between total CABG volume and isolated CABG mortality.

Annualized hospital and surgical volumes were used in these analyses since not every hospital and surgeon conducted CABG procedures during 2005 and 2006. If a hospital or surgeon performed CABG surgeries in both 2005 and 2006, the average volume was considered as the hospital or surgeon’s annualized volume. If a hospital or surgeon performed CABG surgeries in only one of the two years, the single year’s volume was considered as the hospital or surgeon’s annualized volume.

The first analyses evaluated whether a linear relationship existed between hospital and surgeon CABG volume and mortality. In these analyses, annualized hospital and surgeon volumes (both isolated and total volume) were separately included as continuous independent variables in the hierarchical logistic regression models. Second, to evaluate whether different threshold volumes or volume categories were associated with higher or lower mortality, hospitals and surgeons were grouped into volume categories. Then, these hospital and surgeon volume categories were included as indicator variables in separate analyses.

Results

Hospital Volume-Outcome Relation: The 2005-2006 CCORP CABG database contains detailed patient-level clinical data on 32,586 isolated CABG surgery procedures in 121 hospitals. The average annualized hospital isolated CABG surgery volume was 134 cases, with a range among individual hospitals of 6 to 850. The overall operative mortality rate was 2.65%, and the average annualized hospital operative mortality rate was 2.86%, with a range among individual hospitals of 0% to 8.41%.

In the hierarchical model, when hospital isolated CABG volume was entered into the analysis as a continuous variable, there was a significant association with predicted operative mortality (OR = 0.948 and 95% CI = 0.903-0.996 for every additional 100 patients, p-value = 0.038). Similarly, when total hospital CABG volume was entered into the analysis as a continuous variable, there was a significant association with risk-adjusted operative mortality (OR = 0.956, and 95% CI = 0.920-0.993 for every additional 100 patients, p-value = 0.023).

Table 7 presents the summary statistics when annualized hospital isolated CABG volume was categorized into quartiles (<100, 100-199, 200-299, 300-599, ≥600) and dichotomized (≥450 and <450; ≥250 and <250; and ≥100 and <100). The groups were chosen because these volumes were used in prior California volume-outcome analyses. The split point of 450 procedures per year was chosen because of the past volume recommendations by The Leapfrog Group (www.leapfroggroup.org), and the split point of 100 was chosen because of the past volume recommendations by the American College of Cardiology and the American Heart Association (ACC/AHA Practical Guidelines). These data suggest that patients may have a lower risk of dying from an isolated CABG procedure at hospitals with higher annual isolated CABG volume, particularly those four performing more than 450 CABG surgeries per year.

Table 7: Hospital Isolated CABG Volume Groups and Predicted Mortality Outcomes, 2005-2006

Volume Group	Hospitals (n=121) N (%)	Patients (n=32,586) N (%)	OR (95% CI)
≥600	3 (2)	4,267 (13)	0.664 (0.455, 0.969)
300-599	5 (4)	3,942 (12)	0.789 (0.571, 1.091)
200-299	8 (7)	4,043 (12)	0.905 (0.676, 1.212)
100-199	47 (39)	13,188 (41)	0.870 (0.717, 1.057)
<100	58 (48)	7,146 (22)	Reference
≥450	4 (3)	5,294 (16)	0.696 (0.514, 0.944)
<450	117 (97)	27,292 (84)	Reference
≥250	13 (11)	10,925 (34)	0.849 (0.691, 1.042)
<250	108(89)	21,661 (66)	Reference
≥100	63 (52)	25,440 (78)	0.847 (0.707, 1.015)
<100	58 (48)	7,146 (22)	Reference

Note: Bolded groups are significantly different from the reference group.

Table 8 presents the summary statistics when annualized hospital total CABG volume was categorized into quartiles (<100, 100-199, 200-299, 300-599, >=600) and dichotomized (>=450 and <450; >=250 and <250; and ≥100 and <100). These data also suggest that patients have a lower risk of dying from an isolated CABG procedure at four hospitals performing more than 600 total CABG surgeries per year.

Table 8: Hospital Total CABG Volume Groups and Predicted Mortality Outcomes, 2005-2006

Volume Group	Hospitals (n=121) N (%)	Patients (n=32,586) N (%)	OR (95% CI)
≥600	4 (3)*	5,294 (16)	0.631 (0.441, 0.904)
300-599	9 (7)	5,631 (17)	0.865 (0.643, 1.164)
200-299	19 (16)	6,851 (21)	0.976 (0.749, 1.272)
100-199	51 (42)	11,264 (35)	0.853 (0.670, 1.085)
<100	38 (32)	3,546 (11)	Reference
≥450	6 (5)	6,915 (21)	0.804 (0.615, 1.051)
<450	115 (95)	25,671 (79)	Reference
≥250	18 (15)	12,800 (39)	0.887 (0.733, 1.075)
<250	103 (85)	19,786 (61)	Reference
≥100	83 (69)	29,040 (89)	0.864 (0.687, 1.087)
<100	38 (31)	3,546 (11)	Reference

Note: Bolded groups are significantly different from the reference group.

Surgeon Volume Outcome Relation: During 2005 and 2006, 32,586 isolated CABG surgery procedures were conducted by 284 surgeons. The average annualized number of CABG surgeries conducted by the surgeons was 59, with a range among individual surgeons of 1 to 262. The overall operative mortality rate was 2.65%, and the average annualized surgeon operative mortality rate was 3.73%, with a range among individual surgeons of 0% to 100%.

When surgeon isolated CABG volume was entered into the hierarchical model as a continuous variable, there was a significant association with risk-adjusted operative mortality (OR = 0.906, and 95% confidence interval = 0.825-0.996 for every additional 50 patients, p-value = 0.042). Similarly, when total surgeon CABG volume was entered into the analysis as a continuous variable, there was a significant association with risk-adjusted operative mortality (OR = 0.901, and 95% confidence interval = 0.834-0.974 for every additional 50 patients, p-value = 0.009).

Table 9 presents the summary statistics when annualized surgeon isolated volume was categorized into quartiles (<25, 25-49, 50-99, ≥100) and dichotomized (≥100 and <100; and ≥50 and <50). These data suggest that patients may have a lower risk of dying from a CABG procedure when surgeons perform more than 50 isolated CABG procedures per year.

Table 9: Surgeon Isolated CABG Volume Groups and Predicted Mortality Outcomes, 2005-2006

Volume Group	Surgeons (n=284) N (%)	Patients (n=32,586) N (%)	OR (95% CI)
≥100	47 (17)	12,735 (39)	0.659 (0.478, 0.906)
50-99	99 (35)	14,035 (43)	0.573 (0.421, 0.781)
25-49	62 (22)	4,373 (13)	0.736 (0.521, 1.038)
<25	76 (27)	1,443 (4)	Reference
≥100	47(17)	12,735 (39)	1.009 (0.836, 1.218)
<100	237 (73)	19,851 (61)	Reference
≥50	146 (51)	26,770 (82)	0.747 (0.617, 0.905)
<50	138 (49)	5,816 (18)	Reference

Note: Bolded groups are significantly different from the reference group.

Table 10 presents the summary statistics when annualized surgeon total CABG volume was categorized into four groups (<50, 50-99, 100-149, ≥150) and dichotomized (≥150 and <150; ≥100 and <100; and ≥50 and <50). These data also suggest that patients have a lower risk of dying from an isolated CABG procedure when surgeons perform more than 50 total CABG surgeries per year.

Table 10: Surgeon Total CABG Volume Groups and Predicted Mortality Outcomes, 2005-2006

Volume Group	Surgeon (n=284) N (%)	Patients (n=32,586) N (%)	OR (95% CI)
≥150	33 (12)	9,700 (30)	0.672 (0.514, 0.878)
100-149	53 (19)	9,547 (29)	0.640 (0.497, 0.824)
50-99	87 (31)	9,788 (30)	0.677 (0.531, 0.865)
<50	111 (39)	3,551 (11)	Reference
≥150	33 (12)	9,700 (30)	0.927 (0.751, 1.144)
<150	251 (88)	22,886 (70)	Reference
≥100	86 (30)	9,247 (59)	0.843 (0.711, 1.000)
<100	198 (70)	13,339 (41)	Reference
≥50	173 (61)	29,035 (89)	0.664 (0.535, 0.823)
<50	111 (39)	3,551 (11)	Reference

Note: Bolded groups are significantly different from the reference group.

Utilization of Cardiac Intervention Procedures and Observed In-Hospital Mortality

Figure 1 shows change in the use of the two revascularization procedures over time using data from OSHPD's Patient Discharge Data with patient hospitalizations as the unit of analysis. Despite a decrease in 2007, percutaneous coronary intervention (PCI) volume increased steadily from 1997 to 2005. During that time utilization of PCIs in California grew from 44,350 procedures in 1997 to 60,709 procedures in 2005—an increase of 37%, then declined slightly in 2006 and significantly in 2007 to 54,268. Increased use of drug-eluting stents and related Centers for Medicare and Medicaid Services (CMS) reimbursement policy changes may be partly responsible for this rapid growth.¹⁸ During the same timeframe, the number of isolated CABG surgeries dropped from 28,178 in 1997 to 15,036 in 2007 - a decrease of 47% between 1997 and 2007.¹⁹ Non-isolated CABG surgery volume has remained relatively constant, with a slight decline each year since 2000.

Figure 2 presents the trends in observed in-hospital mortality rates for isolated CABG surgeries, non-isolated CABG surgeries and PCIs in California between 1997 and 2007. Over the 11 years

¹⁸ Jason Ryan and David J. Cohen "Are Drug-Eluting Stents Cost-Effective?: It Depends on Whom You Ask" *Circulation* 2006 (114): 1736-1744.

¹⁹ The numbers cited for isolated CABG and PCI volume come from the OSHPD Patient Discharge Data (PDD) and the number of isolated CABGs differs from what is cited earlier in this report for the CCORP registry. Since OSHPD does not maintain a PCI data registry only the PDD provides a consistent source of numbers for both procedures.

between 1997 and 2007, the in-hospital mortality rate for isolated CABG surgeries declined from 3.08%, when the voluntary California CABG Mortality Reporting Program (CCMRP) was launched in 1997, to 1.90% in 2007, the fifth year of the mandatory reporting program. Meanwhile the observed in-hospital mortality rates for non-isolated CABG surgeries also declined from 9.66% in 1997 to 6.92% in 2007. However, the in-hospital mortality rate for PCIs increased slightly from 1.70% in 1997 to 1.75% in 2007.

Medical innovations such as the CABG procedure, Percutaneous Transluminal Coronary Angioplasty (PTCA), and intra-coronary stents, refined during the past 30 years have contributed to improved survival for heart attack patients. The introduction of the intra-coronary stent insertion procedure (small wire cylinders that hold a narrow artery open) in clogged arteries has largely replaced angioplasty without stents because of lower rates of re-narrowing of opened arteries (restenosis) associated with intracoronary stents. New technologies and improved adjunctive medical therapy are making PCI a viable alternative to CABG for many patients. The advantages associated with PCI have been widely noted: PCI involves a shorter hospital stay, is suitable for most patients, and can be repeated and performed without anesthesia by a cardiologist. On the other hand, CABG surgery is associated with lower rates of repeat revascularization, less overall angina, and lower long-term mortality. A more comprehensive approach to examining and reporting on the quality of revascularization procedures in California would include PCI and its outcomes. OSHPD hopes to include PCI reporting in the future.

Figure 1: Volume of Isolated CABG, Non-Isolated CABG, and PCI Surgery in California, 1997-2007

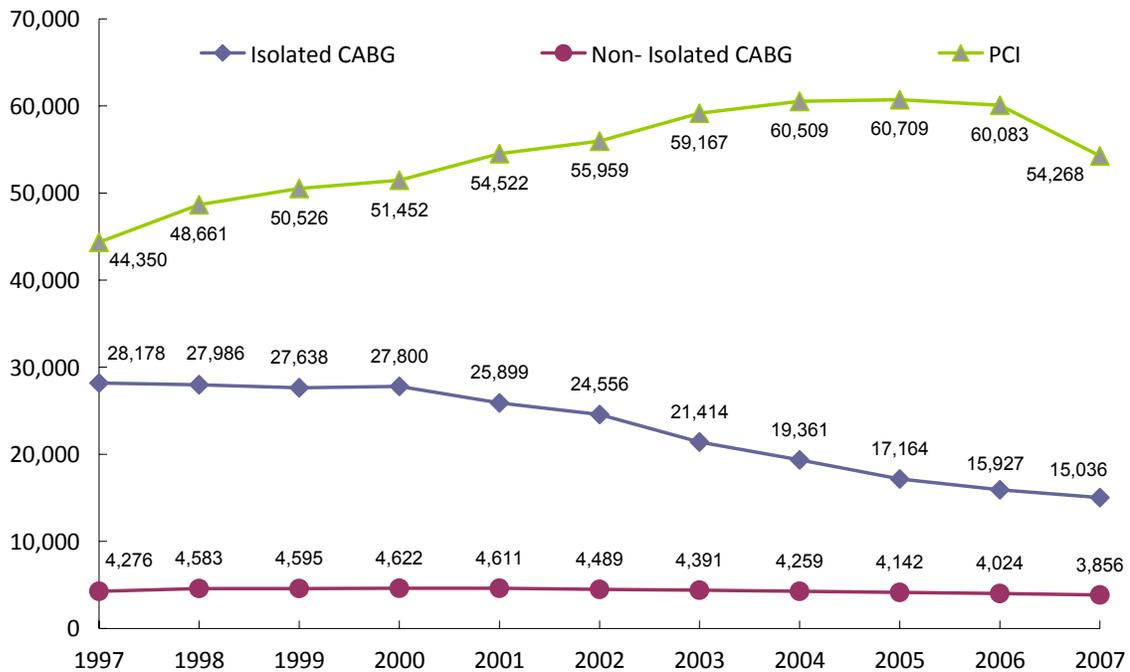
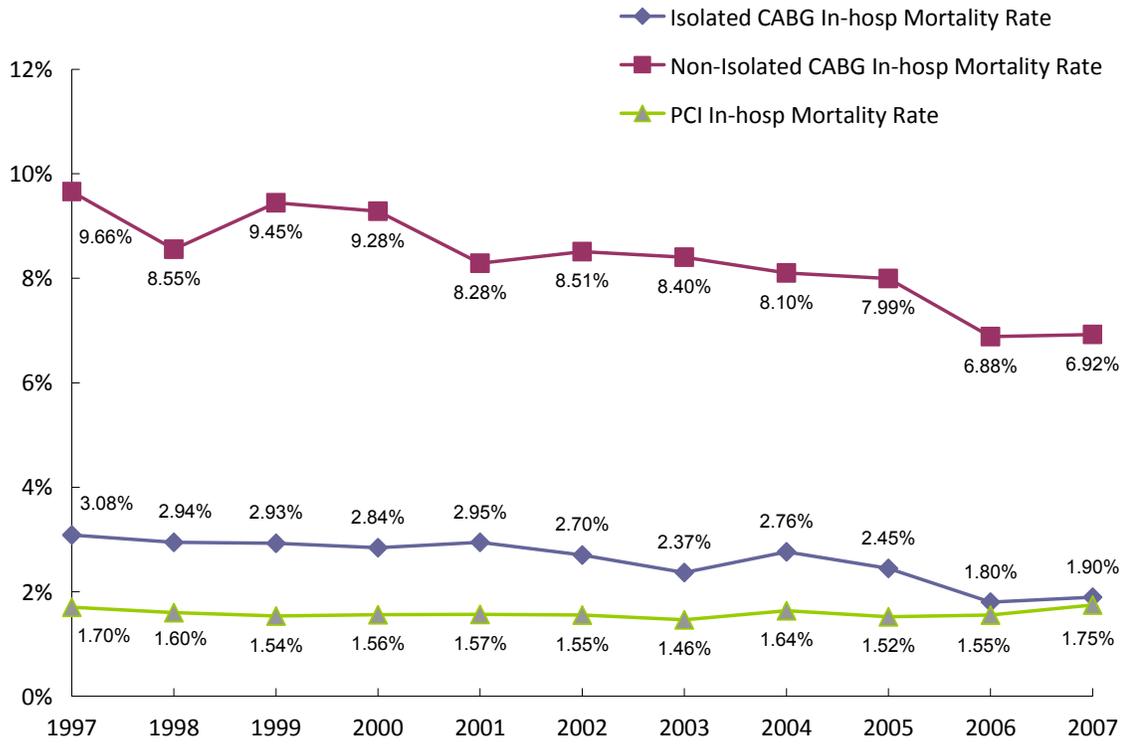


Figure 2: In-Hospital Mortality Rates for Isolated CABG, Non-Isolated CABG, and PCI Surgery in California, 1997-2007



APPENDIX A: HOSPITAL STATEMENTS

Each hospital included in this report was provided with a preliminary report containing the risk-adjustment model, explanatory materials, and results for all hospitals. Hospitals were given a 60-day review period for submitting statements to OSHPD for inclusion in this report. Five hospitals submitted letters which are included here.

Two of the hospitals were concerned with the presentation of the combined hospital-level results for 2005-2006. They argue that the 2006 hospital ratings provide a better picture of their current performance. Recognizing that most readers are interested in the most recent hospital results, the current report highlights the 2006 hospital-level results. However, it also includes the 2005-2006 results since the increased number of patients per hospital over two years provides more stable estimates of hospital performance during that time period.

One hospital noted the significant drop in statewide operative mortality between the 2003-2004 and 2005-2006 report periods and changes in hospital performance ratings between the two reports. This hospital was also concerned with the definition of operative mortality, which includes deaths occurring in the hospital after CABG surgery, regardless of length of stay, but only includes deaths occurring after discharge within 30 days of surgery. OSHPD has adopted the operative mortality definition that the national Society of Thoracic Surgeons (STS) uses for member surgeons to benchmark their own performance. While we recognize that this definition could potentially bias the results of hospitals that do not routinely transfer patients, our analyses to date have not revealed such a bias.

One hospital's primary concern was with their "Low" performance rating for internal mammary artery (IMA) usage, a process measure of surgical quality. This hospital states that IMAs were not used in many cases because of valid reasons, including abnormalities of the IMA or left anterior descending arteries, patient obesity, advanced age, and multiple comorbidities. Because OSHPD's method for calculating IMA usage does not take all these into account, they felt their low score was inappropriate. OSHPD's IMA usage metric takes into consideration most, but not all of the possible reasons for not using the IMA. However, our Clinical Advisory Panel has stated that the remaining valid reasons for non-use should be few and would not by themselves explain very large percentage differences from the statewide hospital IMA rate.

Finally, one hospital commented on their performance over the last 20 years and noted the various measures which have been implemented to improve quality over that time period. They also noted the importance of the human connection between the patient and the surgeon.



September 5, 2008

Holly Hoegh, Ph.D.
Manager, Clinical Data Programs
Office of Statewide Health Planning and Development
400 R Street, Room 250
Sacramento, CA 95811

Dear Dr. Hoegh,

This letter is in response to the 2006 CCORP Hospital Results for Usage of the Internal Mammary Artery (IMA) Report in which the internal mammary usage rating was designated as low for the USC University Hospital. While we acknowledge that the IMA usage rate is lower than other hospitals, we feel there are several factors that account for this finding.

We reviewed the procedures where the internal mammary artery was not used. In two thirds of the operations, there were abnormalities of the IMA or the left anterior descending (LAD) artery which precluded its use. These abnormalities included a significantly calcified or small LAD and a small internal mammary artery. The remaining third of the patients were morbidly obese, advanced in age, had an arteriovenous fistula or had multiple other medical conditions.

The reasons the internal mammary artery was not used directly correlates with the reasons these patients are referred to an academic center for coronary artery bypass. We continue to use the internal mammary artery whenever the patient's clinical condition and their anatomy is favorable. We continue to care for the critically ill patients with advanced coronary artery disease.

Sincerely,

A handwritten signature in black ink, appearing to read "V. Starnes", written over a horizontal line.

Vaughn A. Starnes, M.D.
Hastings Distinguished Professor and Chairman
Department of Cardiothoracic Surgery
Keck School of Medicine
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August 18, 2008

Holly Hoegh, Ph.D.
Manager, Clinical Data Programs
Office of Statewide Health Planning and Development
400 R Street, Room 250
Sacramento, CA 95811

Dear Dr. Hoegh,

This letter is in response to the report entitled: "The 2005-2006 California CABG Outcomes Reporting Program (CCORP) Preliminary Report", which presents hospitals' risk-adjusted mortality rates for CABG in the calendar years 2005-2006 together and 2006 separately. We find the presentation of the combined 2005-2006 data problematic and arbitrary.

The 2005 CCORP risk-adjusted mortality report for LAC+USC Medical Center shows a "worse than expected" rating, while our risk-adjusted mortality for 2006 is "as expected". The reduction in the observed mortality is the result of a brisk quality improvement program. Regrettably, when the data from 2005 and 2006 are combined, LAC+USC rates "worse than expected" and the noted improvement is obscured. Combining these two years of data does not accurately reflect the performance improvement activity in the program in 2006 and is therefore inequitable and misleading.

It is unclear why CCORP has chosen to group the 2005 and 2006 data together. If the goal is to increase the strength of the statistical analysis, it seems that all four years of data should be grouped together. Alternatively, if the intent is to monitor the year to year activity, then it is reasonable and appropriate to report each year separately. This would more accurately reflect important year to year changes in performance.

The LAC+USC Medical Center is dedicated to excellence in patient care and quality improvement. The publicly reported CCORP data is taken extremely seriously and performance is continuously assessed to identify improvement opportunities. Unfortunately, combining the 2005-2006 data for public reporting masks all improvement efforts, undermines the spirit of quality improvement, is damaging to the organization's reputation and is unfairly misleading to the public.

The 2005-2006 Combined CCORP Report does not accurately reflect the changing performance at LAC+USC. For the reasons outlined here we urge you to publish the 2005 and 2006 data independently and object to reporting the combined the data for 2005-2006.

Thank you for the opportunity to submit our comments and recommendations. We are available at your convenience to discuss this matter and look forward to ongoing collaboration.

Sincerely,

Stephanie L. Hall, MD
Chief Medical Officer
LAC+USC Healthcare Network

C: Ismael Nuno, MD, Chief Cardiothoracic Surgery
Nicholas Testa, MD, Associate Medical Director QI
Linda Chan Ph.D., Director Research and Biostatistics



OFFICE OF THE
MEDICAL STAFF

August 27, 2008

Holly Hoegh, Ph.D.
Manager, Clinical Data Programs
Office of Statewide Health Planning and Development
400 R Street, Room 250
Sacramento, CA 95811

Dear Dr. Hoegh,

Torrance Memorial Medical Center received the 2005 -2006 California CABG Outcomes Reporting Program Preliminary Report and appreciates the opportunity to respond to the results.

In the nine years since OSHPD began reporting CABG mortality rates, Torrance Memorial has experienced one year (2005) of being ranked "worse than expected in mortality for isolated CABG procedures. In every other year, OSHPD has reported a CABG mortality rate of "as expected" for Torrance Memorial.

The unfavorable 2005 results negatively influenced the mortality rate calculation for two reporting cycles: 2005 (last year's report) and 2005 – 2006 (the current release). In 2006 alone OSHPD ranked Torrance Memorial's CABG mortality "as expected."

The year 2005 was clearly an unusual year for Torrance Memorial for outcomes of isolated CABG cases. A multi-disciplinary team of physicians and performance improvement staff analyzed all CABG deaths in 2005. This focused review did not reveal any specific finding or trends which may have impacted mortality. We are committed however to continuing to study and make changes as necessary to improve all cardiovascular patient outcomes.

Torrance Memorial is dedicated to continually improving the care delivered to our patients. Again, thank you for the opportunity to respond to the results of the 2005 - 2006 California CABG Outcomes Reporting Program Report.

Sincerely,


David R. Rand, M.D.
Chief of Staff



August 12, 2008

Holly Hoegh, Ph.D., Manager
Clinical Data Programs
Office of Statewide Health Planning and Development
818 "K" St., Room 200
Sacramento, CA 95814

Dear Dr. Hoegh:

I am writing in response to the 2005/2006 California CABG Outcomes Reporting Program (CCORP) preliminary report. Tri-City Medical Center has been an original contributor to outcomes reporting agencies such as the Society of Thoracic Surgeons database including required reporting to CCORP. Our fastidious commitment to quality reporting and our use of data to drive clinical care is unwavering.

Tri-City Medical Center's cardiac surgery performance over the last 20 years with the exception of the 2006 year has met and exceeded both state and national benchmarks. Results from the 2006 CCORP report are inconsistent with our on-going commitment to excellence. During our performance improvement process we recognized the aberrancy in our 2006 data and measures have been implemented to improve our quality and performance scores.

Quality Improvement Initiatives:

- Quality oversight of our data occurs on a weekly to monthly basis via our collaborative multidisciplinary cardiology conference including my personal review
- Each case that contributed to our performance rating was reviewed and demonstrated that optimum care was provided
- An outside review, through a third party, evaluated the Cardiothoracic Surgery Program at Tri-City Medical Center
- Two of the three surgeons who impact our data are no longer performing heart surgery at our institution
- Health Grades reporting agency listed Tri-City Medical Center within the top 10 of the 120 cardiac surgery programs in the state for that year and gave it a 5-star rating for the years 2006 and 2007, being the only 5-star rating given to any of the hospitals in San Diego County





August 12, 2008
Page 2

Clearly the CCORP report can be misleading and cause the public to misunderstand the findings. The report brings together two years of data and misrepresents to the community that negative performance was consistent over the two years, when in fact the 2005 year performance exceeded the state norm and only 2006 resulted in a variation below the state performance. Unfortunately, because of the reporting format, the data shows up on two separate reports.

It is important to note that CCORP's compilation of statistics, graphs and charts does not reflect the human connection between the patient and the surgeon. While the data are important and should be kept up-to-date, it should be used to facilitate quality improvement at any particular institution and should not be used to drive a statistical wedge between competitive hospitals. The more the field of medicine is reduced to be similar to industry in general, the less medical care is delivered with the human element of compassion and individual consideration. Clearly, the field of cardiac surgery is one where the patient and the surgeon meet very privately and make a measured judgment as to the risks and benefits of each particular case.

As our population for coronary artery bypass grafting ages, the challenge to provide the same quality of care and achieve the same statistically significant results that previously existed will become more and more difficult. Rest assured we are aware that we had a challenge in our performance rating for 2006. However our improvement plans and quality review process are determined to reflect the excellent care delivered.

Thank you for the opportunity to respond to the 2005-2006 CCORP report.

Sincerely,

A handwritten signature in black ink that reads "T. Folkerth".

Theodore L. Folkerth, M.D.
Medical Director, Cardiothoracic Surgery
Tri-City Medical Center

cc: Chief of Staff Dr. Richard Burruss





Washington Hospital Healthcare System

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September 3, 2008

Holly Hoegh, PhD
Manager, Clinical Data Systems
Office of Statewide Health Planning and Development
400 R Street, Room 250
Sacramento, CA 95811

Reference: Washington Hospital - Fremont, CA

Dr. Ms. Hoegh:

This letter is in response to correspondence received from the Office of Statewide Health Planning and Development dated July 7, 2008. It represents our official statement as to why the report does not accurately reflect the quality of care provided at Washington Hospital. We appreciate the opportunity to comment on the data presented.

Washington Hospital has participated in the State reporting of coronary artery surgery mortality since its inception in 1999. Only a subset of all California cardiac surgery programs reported on a voluntary basis at that time. In the three voluntary public reports issued by CCMRP from 1999 through 2002, and in the four annual public reports issued by CCORP from 2003 through 2006, Washington Hospital has scored "as expected". In the 2003-2004 California CABG Outcomes Reporting Program combined report, Washington Hospital scored "as expected". In the 2005-2006 California CABG Outcomes Reporting Program combined preliminary report, Washington Hospital is listed as "worse than expected". We have a number of concerns regarding this combined preliminary 2005-2006 CCORP Report. They include:

1. We are surprised at the lack of comment in your report regarding the drop in observed CABG mortality rates in the State of California between 2003-2004 and 2005-2006 (the mortality rate for 2003-2004 was 3.08% and the mortality rate for 2005-2006 was 2.65%). The drop in observed CABG mortality rates is statistically significant. It means "the bar has been raised" for all hospitals in the State, and all hospitals in the report are held to a more rigorous standard than in any other comparison report from the Office of Statewide Health Planning and Development.

Nancy Farber, Chief Executive Officer

Washington Township Health Care District • Washington Hospital • Washington Clinics
Washington-Stanford Radiation Oncology Center • Washington Outpatient Surgery Center
Washington Heart Program • Washington Outpatient Rehabilitation Center • Washington Center for Joint Replacement
Institute for Minimally Invasive and Robotic Surgery

2. We believe the impact of this statistically significant drop in mortality on CCORP's regression model and resulting performance ratings should be addressed in the report.
3. Clearly, the 2005-2006 CCORP Report performance ratings are different from all previous reports and contain anomalies. In the two year combined period of time in which the cardiac surgery mortality rate for all California hospitals improved by over 14%, no one hospital performed "better than expected". Eight individually listed hospitals performed "better than expected" in years 2005 and 2006 but when those results are combined in the 2005-2006 CCORP Report, no hospital performed "better" than expected. The 2005-2006 CCORP Report does not recognize individually or collectively the superior results of California hospitals and California cardiac surgeons. On the other hand, five individually listed hospitals were rated "worse than expected" in years 2005 and 2006, and, when those reports are combined in the 2005-2006 CCORP Report, six hospitals were rated "worse than expected" This combined report included Washington Hospital despite the fact that Washington Hospital did not appear in either individual report. The results of all previous CCORP reports (whether annual or combined) have followed a distribution pattern that has approximated a normal curve. Performance ratings had an equivalent number of hospitals rated as "better than expected" and "worse than expected". The fact that the CCORP 2005-2006 Report results are not distributed normally makes them "different" from all previous reports and apparently biased. Perhaps consideration should be given to only evaluating and making public single year results.
4. We would like to point out that the CCORP database includes the mortality of patients who have been in the hospital for extended lengths of stay. Washington Hospital is a District Hospital that takes care of all residents within its District borders, regardless of their socioeconomic status. Washington Hospital also accepts transfers and admission of patients from surrounding hospitals who do not provide cardiac surgery service. Many of our patients will not or cannot be accepted to the next level of care in neighboring facilities due to their socioeconomic status. This means that we regularly can and do have cardiac surgery patients presented to the hospital with multiple co-morbid conditions who often stay in excess of thirty days. We believe that CABG patients who expire after a prolonged length of stay from conditions not related to their cardiac surgery should not be included in a state-mandated, publicly reported database. Inclusion of this data unfairly penalizes both the hospitals and the surgeons involved.

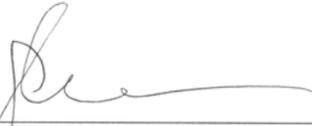
Finally, we would like to point out that the observed mortality rate of CABG patients at Washington Hospital has declined between 2005 and 2006, has declined again between 2006 and 2007, and, so far, has declined again between 2007 and 2008. This is a clear indication that Washington Hospital is firmly committed to continuously improving the quality of care provided to cardiac surgery patients and to the "patient first" ethic.

Should you have any questions or wish to discuss these matters further, please feel free to contact me at (510) 745-6513.

Sincerely,



Edward J. Fayeh
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System Operations and Management Support
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EF/mlc



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