

Technical Note

For

**The California Report on
Coronary Artery
Bypass Graft Surgery 2011-2012:
Hospital and Surgeon Data**

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Introduction

This technical note describes the research methods used to develop *Coronary Artery Bypass Graft (CABG) Surgery in California, 2011-2012*, the tenth report produced by the California CABG Outcomes Reporting Program (CCORP) of the Office of Statewide Health Planning and Development (OSHPD) in compliance with California Health and Safety Code Sections 128745-128750 and can be found at: http://tstoshpd/HID/Products/Clinical_Data/CABG/11-12Breakdown.html. See Appendix A for definitions of some of the technical terms used in this document.

Data Quality Review and Verification

Population

Under state law, California-licensed hospitals are required to report all isolated and non-isolated CABG surgeries to OSHPD. Isolated CABG surgery is defined as CABG surgery performed without other major procedures, such as valve repair or carotid endarterectomy, during the same surgery. CCORP’s detailed definition of isolated CABG surgery can be found on pages 33-34 of the training manual:

http://www.oshpd.ca.gov/HID/SubmitData/CCORP_CABG/TrainingManual_2ndHalf2011.pdf.

Table A shows the distribution of CABG surgeries in 2011 and 2012. For 2011 and 2012, there were 31,485 adult CABG surgeries performed in California. Of these, 24,119 (77%) were isolated CABG surgeries and 7,366 (23%) were non-isolated CABG surgeries. Isolated CABG surgery cases are used as the study population because uniformity of the surgical process allows adequate pre-operative risk adjustment for patient conditions. Non-isolated CABG cases are not used to determine hospital or surgeon performance ratings in this report. The study population for most outcomes in this report consists of all adult patients who underwent isolated CABG surgery and were discharged in 2012. However, for surgeon results and post-operative stroke results, the study population includes those patients who were discharged in 2011 *and* 2012.

Table A. California CABG Surgery Volume, 2011-2012

CABG type	2011		2012		2011-2012 combined	
	Cases	%	Cases	%	Cases	%
Isolated CABGs	12,399	76%	11,720	77%	24,119	77%
Non-isolated CABGs	3,893	24%	3,473	23%	7,366	23%
All CABGs	16,292	100%	15,193	100%	31,485	100%

Note: CABG counts exclude salvage cases. 2011-2012 combined data used for calculating hospital post-operative stroke rates and surgeon operative mortality rates.

Data Sources

The primary data source for this report is the 2011 and 2012 clinical data registry collected by CCORP from 126 hospitals and 272 surgeons. 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 30 days following CABG surgery. These data were also linked to OSHPD’s Patient Discharge Data (PDD) to identify patients who were discharged alive, and were readmitted to a hospital within 30 days of CABG surgery.

The CCORP clinical data registry primarily consists of data elements from the Society of Thoracic Surgeons' (STS) Adult Cardiac Surgery Database. However, it also includes a few data elements exclusive to CCORP. Although STS and CCORP data definitions are generally identical, CCORP provides additional clarifications to assist hospitals with coding. All data elements and their definitions can be found in the training manual at:

http://www.oshpd.ca.gov/HID/SubmitData/CCORP_CABG/TrainingManual_2ndHalf2011.pdf.

CCORP reviews the data submitted by each hospital for completeness and errors. Using a three-step data quality review and verification process, CCORP asks hospitals to check data quality, data discrepancies, and potential risk-factor coding problems.

Step 1: Data Collection and Acceptance

Hospitals report their data using CCORP's online clinical data collection system, Cardiac Online Reporting for California (CORC). Automated data acceptance reports notify hospitals of invalid, missing and abnormally high or low data values. Data quality reports are also generated each time a hospital submits data. Hospitals review these summary reports before they adjust, finalize and certify their data submission.

Step 2: Data Discrepancy Reports

Data discrepancy reports compare the CCORP clinical registry data to OSHPD's Patient Discharge Data (PDD) file (the hospital administrative data record). Hospitals are asked to review and account for discrepancies between the two data sources via patient medical chart review to verify that 1) all CABG surgeries discharged in 2011 and 2012 were reported; 2) each CABG was accurately coded as isolated or non-isolated CABG surgery; 3) coding of *Discharge Status* was consistent; 4) *Resuscitation* occurred prior to CABG surgery; and 5) coding of post-operative complications (including strokes) was consistent.

Step 3: Risk-Factor Coding Reports

Risk-factor coding reports identify values that may be extreme by comparing the hospital reported prevalence rates in the current year to prior years and to administrative data from the PDD. CCORP requests hospitals to review and, when necessary, correct miscoded data elements.

Hospital Medical Chart Audit

After completing the data quality review and verification process, CCORP develops a preliminary risk model for operative mortality and post-operative stroke to help identify candidate hospitals for an on-site medical chart audit. Candidate selection for the 2012 audit was based on results of the preliminary model which identified "**Better**" or "**Worse**" hospital performers and on data quality reports that identified problems in over- and under-reporting of patient-risk factors. Additionally, a small number of hospitals were randomly selected for audit.

The 2012 audit included 37 hospitals and a total of 2,596 patient records (30% of 124 hospitals and approximately 17% of all CABG surgery cases in 2012). On-site medical chart reviews were conducted by trained, independent auditors under contract with OSHPD. All isolated CABG deaths and post-operative strokes at 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 40 to 160 cases. If a selected hospital

performed fewer than 40 isolated CABG surgeries per year, all surgeries were audited. Individual audit summary reports were sent to each hospital for review and comment.

Risk Model for Adjusting Hospital and Surgeon Operative Mortality Rates, 2011-2012

This section explains the development and validation of CCORP's risk model that accounts for the variation in patient severity of illness for hospital and surgeon operative mortality. CCORP used a multivariable logistic regression model to estimate the relationship between each of the demographic and pre-operative risk factors and the probability of operative mortality.

To develop the risk model for hospital and surgeon mortality rates, the 24,119 isolated (non-salvage) CABG surgery cases in 2011-2012 were evaluated for missing data; 23,015 cases had no missing data in any field and were used for the risk model parameter estimation. The 1,104 (4.6%) 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 1,104 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 for the following reasons: 1) some hospitals leave data fields blank by design when the risk factor is absent or the value is normal; 2) maintains consistency with other major cardiac reporting programs that replace missing data with the lowest-risk or normal value; and 3) 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. CCORP summed these probabilities to estimate the expected mortality for each hospital. The risk model, based on the 2011-2012 data, is presented in Table B-1 with statistically significant risk factors identified in bolded text.

Table B-1: Logistic Regression Risk Model for Operative Mortality, 2011-2012

Risk Factor		Coefficient	Standard Error	P-value	Odds Ratio
Intercept		-8.625	0.495	<.0001	
Age (Years)		0.043	0.005	<.0001	1.044
Gender	Male	Reference			
	Female	0.461	0.104	<.0001	1.585
Race	White	Reference			
	Non-White	-0.161	0.104	0.122	0.852
Body Mass Index	18.5-39.9	Reference			
	<18.5	0.526	0.384	0.171	1.693
	≥40.0	0.607	0.200	0.003	1.835
Status of the Procedure	Elective	Reference			
	Urgent	0.085	0.131	0.515	1.089
	Emergent	0.479	0.243	0.049	1.614
Last Creatinine Level (mg/dl)		0.963	0.143	<.0001	2.620
Hypertension		0.186	0.178	0.295	1.204

Risk Factor		Coefficient	Standard Error	P-value	Odds Ratio
Peripheral Arterial Disease		0.481	0.117	<.0001	1.618
Cerebrovascular Disease		0.308	0.169	0.069	1.361
Cerebrovascular Accident (CVA)Timing	No CVA	Reference			
	> 2 weeks	0.180	0.201	0.370	1.198
	≤ 2 weeks	-0.858	1.059	0.418	0.424
Chronic Lung Disease	None/Mild	Reference			
	Moderate	0.128	0.196	0.515	1.136
	Severe	0.431	0.183	0.018	1.539
Immunocompromised		0.630	0.221	0.004	1.877
Atrial Fibrillation/Flutter		0.416	0.135	0.002	1.515
Third Degree Heart Block		0.150	0.418	0.720	1.161
Sustained VT/VF		0.483	0.194	0.013	1.621
Timing of Myocardial Infarction (MI)	No MI				
	21 or more days	-0.103	0.160	0.519	0.902
	8-20 days ago	0.338	0.193	0.081	1.402
	1-7 days ago	0.268	0.133	0.044	1.308
	Within 24 Hours	0.748	0.215	0.001	2.112
Cardiogenic Shock		1.189	0.235	<.0001	3.285
Heart Failure		0.111	0.136	0.415	1.117
NYHA Classification	IV vs. I,II,III	0.314	0.162	0.052	1.369
Prior Cardiac Surgery	None	Reference			
	One or more	0.859	0.192	<.0001	2.360
Interval from Prior PCI to Surgery	No Prior PCI	Reference			
	Prior PCI > 6 HRS	0.198	0.114	0.083	1.219
	Prior PCI ≤ 6 HRS	0.862	0.290	0.003	2.367
Ejection Fraction (%)		-0.016	0.004	<.0001	0.984
Left Main Disease (≥ 50%)		0.249	0.100	0.013	1.283
Number of Diseased Vessels	None, One, or Two	Reference			
	Three or more	0.189	0.126	0.133	1.208
Mitral Insufficiency	None/Trivial/Mild				
	Moderate/Severe	0.237	0.145	0.103	1.267

Bolded text indicates statistically significant.

Note: Last Creatinine Level and Ejection Fraction were modeled using piecewise linear transformations.

Discrimination of Risk Model for Operative Mortality

For the 2011-2012 risk model, the C-statistic was 0.801. In recently published CABG surgery mortality reports by other states (New Jersey, New York, and Pennsylvania), the C-statistics ranged from 0.791 to 0.836.

Calibration of Risk Model for Operative Mortality

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 this 2011-2012 risk model is 0.047.

A second calibration test sorts the data and compares observed deaths with predicted deaths in each of 10 risk groups. As presented in Table B-2, Risk Group 10 shows the patients in the highest risk group. Among the 2,291 patients in Group 10, 210 patients died, and the model predicted 213.9 patient deaths. Assuming a Poisson distribution for a binary outcome, the predicted range of deaths for Risk Group 10 is 185.2 to 242.5. The observed number of 235 deaths falls within the range of predicted deaths. Except for Group 9, where the model slightly under-predicted deaths, nine of the 10 risk groups had neither significantly fewer nor significantly more deaths than were predicted by the model.

Table B-2: Calibration of Risk Model for Operative Mortality, 2011-2012

Risk Group	Isolated CABG Cases	Observed Deaths	Predicted Deaths	Difference	95%CI of Predicted Deaths
1	2,303	5	6.9	1.9	(1.8, 12.1)
2	2,302	5	10.9	5.9	(4.4, 17.4)
3	2,303	10	14.4	4.4	(7.0, 21.9)
4	2,303	22	18.1	-3.9	(9.7, 26.4)
5	2,303	23	22.5	-0.5	(13.2, 31.8)
6	2,302	23	28.4	5.4	(18.0, 38.9)
7	2,302	29	36.5	7.5	(24.7, 48.4)
8	2,304	52	49.7	-2.3	(35.9, 63.5)
9	2,302	97	74.7	-22.4	(57.7, 91.6)
10	2,291	210	213.9	3.9	(185.2, 242.5)
Total	23,015	476	476.0	0	

Note: Risk Group 1 is at lowest risk for mortality and Risk Group 10 is at highest risk.

Process for Calculating Hospital and Surgeon Risk-Adjusted Mortality Rates and Performance Rating

The risk-adjusted mortality rate (RAMR) is computed by dividing the provider's observed mortality by the provider's expected mortality (obtained from the risk model calculation) to get the observed/expected (O/E) ratio. The O/E ratio is then multiplied by the statewide mortality rate (2.11% in 2012 and 2.06% in 2011-2012) to obtain the provider's risk-adjusted mortality rate. However, because a provider's point estimate of the RAMR can be attributed to chance, the performance rating is not based on a point estimate of the RAMR, but a comparison of the 95%

confidence interval (CI) of each provider's RAMR to the statewide mortality rate.¹ CCORP treated the 2011 and 2012 data as a sample, and inferred a range within which each provider's true performance was likely to fall. As shown in Tables B-3 and B-4, a provider's performance rating is "**Better**" if the upper 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.) A provider's performance rating is "**Worse**" if the lower 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.) If the state average mortality rate is within the 95% CI of a provider's RAMR, then the performance rating is "**Average**."

Statistical Details of Hospital Risk-Adjusted Operative Mortality Rate Results, 2012

Among the 11,720 isolated and non-salvage CABG surgeries performed at 124 hospitals in 2012, 247 patients died either in-hospital or within 30 days of the surgery date, reflecting a statewide operative mortality rate of 2.11%. The *observed* mortality rates among hospitals ranged from 0% to 20.00%. The *expected* mortality rates, which are generated by the risk model and account for patient severity-of-illness, were between 0.75% and 5.83%. The risk-adjusted mortality rates (RAMR), which measure hospital performance, ranged from 0% to 17.93%.

Based on the 95% confidence intervals for RAMR, 123 of 124 hospitals (99%) performed within the expected range when compared to the statewide mortality rate, and one hospital performed significantly "**Worse**" than the state average (Table B-3).

¹ CCORP uses the Poisson Exact Probability method to compute the 95% confidence interval for the risk-adjusted mortality rate. (Buchan Iain, *Calculating Poisson Confidence Interval in Excel*, January 2004).

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
Sacramento Valley & Northern California Region	Enloe Medical Center – Esplanade Campus	157	132	1	0.76	2.07	0.78	(0.02, 4.32)	Average
	Mercy General Hospital	692	451	9	2.00	1.87	2.27	(1.04, 4.30)	Average
	Mercy Medical Center – Redding	137	104	2	1.92	2.72	1.50	(0.18, 5.41)	Average
	Mercy San Juan Hospital	157	114	0	0.00	1.85	0.00	(0.00, 3.70)	Average
	Rideout Memorial Hospital	116	96	4	4.17	1.98	4.47	(1.21, 11.41)	Average
	Shasta Regional Medical Center	78	69	2	2.90	1.75	3.52	(0.43, 12.69)	Average
	St. Joseph Hospital – Eureka	23	18	0	0.00	5.84	0.00	(0.00, 7.44)	Average
	Sutter Memorial Hospital	437	324	4	1.23	2.20	1.19	(0.32, 3.04)	Average
	UC Davis Medical Center	142	105	2	1.90	1.45	2.79	(0.34, 10.06)	Average
San Francisco Bay Area & San Jose	Alta Bates Summit Medical Center – Summit Campus	146	112	3	2.68	2.40	2.37	(0.49, 6.91)	Average
	California Pacific Medical Center – Pacific Campus	85	65	0	0.00	1.87	0.00	(0.00, 6.42)	Average
	Community Hospital Monterey Peninsula	89	69	1	1.45	2.17	1.42	(0.04, 7.89)	Average
	Dominican Hospital – Santa Cruz/Soquel	75	58	2	3.45	1.90	3.85	(0.47, 13.87)	Average
	El Camino Hospital	83	59	1	1.69	1.94	1.86	(0.05, 10.32)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
San Francisco Bay Area & San Jose (continued)	Good Samaritan Hospital – San Jose	100	76	1	1.32	1.93	1.45	(0.04, 8.07)	Average
	John Muir Medical Center – Concord Campus	273	218	3	1.38	1.79	1.63	(0.34, 4.75)	Average
	Kaiser Foundation Hospital – San Francisco	412	316	8	2.53	1.28	4.21	(1.81, 8.28)	Average
	Kaiser Foundation Hospital – Santa Clara	304	204	2	0.98	1.87	1.12	(0.13, 4.02)	Average
	Marin General Hospital	47	40	0	0.00	1.64	0.00	(0.00, 11.93)	Average
	North Bay Medical Center	59	56	2	3.57	1.63	4.65	(0.56, 16.77)	Average
	O'Connor Hospital – San Jose	65	55	2	3.64	1.73	4.46	(0.54, 16.08)	Average
	Peninsula Medical Center	62	45	0	0.00	1.36	0.00	(0.00, 12.83)	Average
	Queen of the Valley Hospital – Napa	67	56	1	1.79	2.52	1.50	(0.04, 8.37)	Average
	Regional Medical of San Jose	75	61	0	0.00	2.37	0.00	(0.00, 5.40)	Average
	Salinas Valley Memorial Hospital	92	75	2	2.67	1.77	3.19	(0.39, 11.51)	Average
	San Ramon Regional Medical Center	34	33	0	0.00	1.61	0.00	(0.00, 14.76)	Average
	Santa Clara Valley Medical Center	101	87	2	2.30	1.06	4.63	(0.56, 16.68)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
San Francisco Bay Area & San Jose (continued)	Santa Rosa Memorial Hospital – Montgomery	77	61	2	3.28	2.17	3.20	(0.39, 11.55)	Average
	Sequoia Hospital	93	52	0	0.00	2.75	0.00	(0.00, 5.46)	Average
	Seton Medical Center	42	38	2	5.26	1.94	5.76	(0.70, 20.74)	Average
	St. Helena Hospital	67	55	2	3.64	4.34	1.78	(0.21, 6.41)	Average
	St. Mary's Medical Center – San Francisco	22	19	1	5.26	3.12	3.58	(0.09, 19.91)	Average
	Stanford Hospital	123	71	0	0.00	1.92	0.00	(0.00, 5.73)	Average
	Sutter Medical Center of Santa Rosa	88	66	0	0.00	1.30	0.00	(0.00, 9.09)	Average
	UCSF Medical Center†	81	60	5	8.33	2.16	8.18	(2.65, 19.05)	Worse
	ValleyCare Medical Center	44	38	0	0.00	1.70	0.00	(0.00, 12.10)	Average
	Washington Hospital – Fremont	83	77	1	1.30	2.63	1.05	(0.03, 5.84)	Average
Central California	Bakersfield Heart Hospital	100	80	1	1.25	2.33	1.14	(0.03, 6.33)	Average
	Bakersfield Memorial Hospital	147	123	2	1.63	2.31	1.50	(0.18, 5.39)	Average
	Community Regional Medical Center – Fresno	276	234	7	2.99	2.12	3.00	(1.20, 6.17)	Average
	Dameron Hospital	49	43	3	6.98	3.45	4.30	(0.88, 12.54)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
Central California (continued)	Doctors Medical Center	270	222	6	2.70	2.72	2.11	(0.77, 4.58)	Average
	Emanuel Medical Center	18	15	0	0.00	2.27	0.00	(0.00, 22.92)	Average
	Fresno Heart and Surgical Center	224	187	1	0.53	1.70	0.66	(0.02, 3.69)	Average
	Kaweah Delta Medical Center	158	141	3	2.13	1.87	2.41	(0.50, 7.04)	Average
	Marian Medical Center	80	62	1	1.61	2.58	1.33	(0.03, 7.39)	Average
	Memorial Hospital Medical Center – Modesto	172	133	1	0.75	1.88	0.85	(0.02, 4.73)	Average
	San Joaquin Community Hospital	67	58	1	1.72	1.94	1.89	(0.05, 10.49)	Average
	St. Agnes Medical Center	277	240	10	4.17	2.08	4.25	(2.03, 7.79)	Average
	St. Joseph's Medical Center of Stockton	242	178	7	3.93	3.98	2.10	(0.84, 4.32)	Average
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara	Antelope Valley Hospital	20	20	0	0.00	1.97	0.00	(0.00, 19.82)	Average
	Community Memorial Hospital of San Buenaventura	110	95	5	5.26	2.25	4.97	(1.61, 11.58)	Average
	French Hospital Medical Center	97	65	2	3.08	3.05	2.14	(0.26, 7.71)	Average
	Glendale Adventist Medical Center – Wilson Terrace	127	115	4	3.48	1.84	4.02	(1.09, 10.27)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara (continued)	Glendale Memorial Hospital and Health Center	135	117	1	0.85	1.36	1.34	(0.03, 7.43)	Average
	Los Robles Hospital and Medical Center	73	51	0	0.00	2.19	0.00	(0.00, 7.00)	Average
	Northridge Hospital Medical Center	68	59	4	6.78	2.58	5.58	(1.52, 14.26)	Average
	Palmdale Regional Medical Center	14	11	1	9.09	1.44	13.43	(0.34, 74.65)	Average
	Providence Holy Cross Medical Center	72	62	2	3.23	3.25	2.11	(0.25, 7.60)	Average
	Providence St. Joseph Medical Center	60	48	2	4.17	2.24	3.95	(0.48, 14.24)	Average
	Providence Tarzana Medical Center	50	39	2	5.13	1.98	5.50	(0.66, 19.82)	Average
	Santa Barbara Cottage Hospital	113	92	2	2.17	1.58	2.92	(0.35, 10.51)	Average
	St. John's Regional Medical Center	87	64	1	1.56	1.88	1.77	(0.04, 9.83)	Average
	Valley Presbyterian Hospital	58	49	2	4.08	1.54	5.62	(0.68, 20.25)	Average
	West Hills Hospital and Medical Center	52	41	3	7.32	1.87	8.30	(1.71, 24.19)	Average
Greater Los Angeles	Beverly Hospital	23	20	0	0.00	2.18	0.00	(0.00, 17.96)	Average
	California Hospital Medical Center – Los Angeles	8	8	0	0.00	1.75	0.00	(0.00, 55.87)	Average
	Cedars Sinai Medical Center	183	111	3	2.70	1.52	3.77	(0.77, 10.98)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
Greater Los Angeles (continued)	Centinela Hospital Medical Center	28	26	1	3.85	2.44	3.35	(0.08, 18.63)	Average
	Citrus Valley Medical Center – IC Campus	134	113	4	3.54	1.72	4.38	(1.19, 11.18)	Average
	Downey Regional Medical Center	42	39	1	2.56	1.45	3.75	(0.09, 20.85)	Average
	Garfield Medical Center	154	136	0	0.00	1.66	0.00	(0.00, 3.46)	Average
	Good Samaritan Hospital – Los Angeles	104	85	2	2.35	2.22	2.25	(0.27, 8.12)	Average
	Henry Mayo Newhall Memorial Hospital	4	2	0	0.00	0.81	0.00	(0.00, 100.0)	Average
	Hollywood Presbyterian Medical Center	26	22	0	0.00	1.10	0.00	(0.00, 32.44)	Average
	Huntington Memorial Hospital	99	65	1	1.54	1.56	2.10	(0.05, 11.66)	Average
	Kaiser Foundation Hospital – Sunset	666	512	4	0.78	1.75	0.95	(0.26, 2.42)	Average
	Keck Hospital of USC	133	55	1	1.82	1.77	2.18	(0.05, 12.10)	Average
	Los Angeles County/ University of Southern California Medical Center	136	112	1	0.89	0.76	2.51	(0.06, 13.95)	Average
	Los Angeles County/ Harbor – UCLA Medical Center	84	68	1	1.47	1.38	2.26	(0.06, 12.55)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
Greater Los Angeles (continued)	Lakewood Regional Medical Center	92	81	3	3.70	2.99	2.63	(0.54, 7.68)	Average
	Long Beach Memorial Medical Center	177	154	3	1.95	2.50	1.66	(0.34, 4.83)	Average
	Methodist Hospital of Southern California	59	48	0	0.00	1.83	0.00	(0.00, 8.91)	Average
	Presbyterian Intercommunity Hospital	134	74	1	1.35	1.73	1.66	(0.04, 9.25)	Average
	Providence Little Company of Mary Medical Center – Torrance	79	56	1	1.79	1.99	1.91	(0.05, 10.60)	Average
	Ronald Reagan UCLA Medical Center	218	102	2	1.96	2.55	1.63	(0.20, 5.88)	Average
	St. Francis Medical Center	33	27	0	0.00	1.24	0.00	(0.00, 23.32)	Average
	St. John's Health Center	48	31	0	0.00	1.56	0.00	(0.00, 16.19)	Average
	St. Mary Medical Center	40	33	0	0.00	2.29	0.00	(0.00, 10.36)	Average
	St. Vincent Medical Center	82	73	3	4.11	2.45	3.57	(0.73, 10.41)	Average
	Torrance Memorial Medical Center	65	36	0	0.00	2.94	0.00	(0.00, 7.40)	Average
	White Memorial Medical Center	66	60	2	3.33	1.75	4.05	(0.49, 14.60)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
Inland Empire, Riverside & San Bernardino	Desert Regional Medical Center	124	98	4	4.08	2.70	3.21	(0.87, 8.21)	Average
	Desert Valley Hospital	5	5	1	20.00	2.37	17.93	(0.45, 99.66)	Average
	Eisenhower Medical Center	180	145	3	2.07	2.52	1.75	(0.36, 5.10)	Average
	Loma Linda Murrieta**	47	44	NA	NA	NA	NA	NA	NA
	Loma Linda University Medical Center	231	187	7	3.74	1.99	3.99	(1.60, 8.21)	Average
	Pomona Valley Hospital Medical Center	120	108	0	0.00	3.00	0.00	(0.00, 2.41)	Average
	Riverside Community Hospital	233	199	3	1.51	2.37	1.35	(0.28, 3.95)	Average
	San Antonio Community Hospital	161	127	3	2.36	1.87	2.69	(0.55, 7.85)	Average
	St. Bernardine Medical Center	583	508	8	1.57	1.79	1.87	(0.80, 3.67)	Average
	St. Mary Regional Medical Center	104	88	1	1.14	1.74	1.39	(0.04, 7.72)	Average
Orange County	AHMC Anaheim Regional Medical Center	139	100	2	2.00	1.43	2.96	(0.36, 10.68)	Average
	Fountain Valley Regional Hospital and Medical Center – Euclid	105	96	1	1.04	2.12	1.04	(0.03, 5.81)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
Orange County (continued)	Hoag Memorial Hospital Presbyterian	198	114	2	1.75	3.89	0.96	(0.12, 3.45)	Average
	Mission Hospital Regional Medical Center	142	116	2	1.72	2.72	1.35	(0.16, 4.86)	Average
	Orange Coast Memorial Medical Center	74	56	1	1.79	1.49	2.54	(0.06, 14.13)	Average
	Saddleback Memorial Medical Center	83	72	3	4.17	1.72	5.13	(1.06, 14.97)	Average
	St. Joseph Hospital – Orange	108	74	0	0.00	1.78	0.00	(0.00, 5.93)	Average
	St. Jude Medical Center	100	87	1	1.15	2.42	1.01	(0.03, 5.61)	Average
	UC Irvine Medical Center	65	54	1	1.85	3.58	1.10	(0.03, 6.11)	Average
	West Anaheim Medical Center	21	21	2	9.52	2.92	6.92	(0.84, 24.95)	Average
	Western Medical Center – Santa Ana	60	45	1	2.22	2.15	2.20	(0.06, 12.22)	Average
	Western Medical Center Hospital – Anaheim	70	56	1	1.79	2.01	1.89	(0.05, 10.50)	Average
Greater San Diego	Alvarado Hospital Medical Center†	40	32	0	0.00	2.24	0.00	(0.00, 10.93)	Average
	Grossmont Hospital	177	138	6	4.35	3.80	2.43	(0.89, 5.27)	Average
	Palomar Medical Center	67	47	1	2.13	1.89	2.40	(0.06, 13.32)	Average

Table B-3: Hospital Risk-Adjusted Mortality Results by Region, 2012

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		15,193	11,720	247	2.11				
Greater San Diego (continued)	Scripps Green Hospital	68	31	0	0.00	1.33	0.00	(0.00, 18.90)	Average
	Scripps Memorial Hospital – La Jolla	294	203	2	0.99	1.81	1.16	(0.14, 4.18)	Average
	Scripps Mercy Hospital	165	131	3	2.29	1.73	2.81	(0.58, 8.18)	Average
	Sharp Chula Vista Medical Center	116	86	5	5.81	3.06	4.04	(1.31, 9.40)	Average
	Sharp Memorial Hospital	138	76	2	2.63	2.09	2.68	(0.32, 9.65)	Average
	Tri-City Medical Center	95	79	5	6.33	2.34	5.76	(1.87, 13.41)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	119	69	0	0.00	1.39	0.00	(0.00, 8.16)	Average

*A hospital is classified as **“Better”** if the upper 95% CI of the RAMR falls below the California observed mortality rate (2.11%). 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 **“Average”** if the California mortality rate falls within the 95% CI of a hospital’s RAMR.

**Hospital results are not shown because data necessary to confirm deaths and readmissions was not available.

† Hospitals submitted statements regarding this report. See Appendix C for their statements.

Statistical Details of Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

Among the 24,119 isolated and non-salvage CABG surgeries performed in 2011 and 2012, 498 patients died either in-hospital or within 30 days of the surgery date, reflecting a statewide operative mortality rate of 2.06%. The *observed* mortality rates among surgeons overall ranged from 0% to 21.43%. The *expected* mortality rates, which are generated by the risk model and account for patient severity of illness, ranged from 0.27% and 6.43%. The risk-adjusted mortality rates (RAMR) ranged from 0% to 43.88%.

Based on the 95% confidence intervals for the risk-adjusted mortality rates, 263 of 272 surgeons (97%) performed within the expected range when compared to the statewide mortality rate. Three surgeons performed significantly **“Better”** than the state average, and six surgeons performed significantly **“Worse”** than the state average (Table B-4).

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Abolhoda, Amir M.	Surgeon Overall	44	40	0	0.00	1.07	0.00	(0.00, 17.69)	Average
	UC Irvine Medical Center	44	40	0	0.00	1.07	0.00	(0.00, 17.69)	Average
Abraham, Reginald G.	Surgeon Overall	48	42	2	4.76	2.20	4.47	(0.54, 16.12)	Average
	Desert Valley Hospital	3	3	1	33.33	2.20	31.29	(0.79, 100.0)	Average
	Fountain Valley Regional Hospital and Medical Center – Euclid	44	38	1	2.63	2.24	2.43	(0.06, 13.49)	Average
	Shasta Regional Medical Center	1	1	0	0.00	0.66	0.00	(0.00, 100.0)	Average
Adamson, Robert M.	Surgeon Overall	67	34	0	0.00	1.17	0.00	(0.00, 19.09)	Average
	Sharp Memorial Hospital	67	34	0	0.00	1.17	0.00	(0.00, 19.09)	Average
Afifi, Alaa Y.	Surgeon Overall	61	56	2	3.57	1.58	4.67	(0.56, 16.83)	Average
	AHMC Anaheim Regional Medical Center	8	8	1	12.50	1.29	19.94	(0.50, 100.0)	Average
	Fountain Valley Regional Hospital and Medical Center – Euclid	21	21	0	0.00	2.13	0.00	(0.00, 16.98)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Afifi, Alaa Y. (continued)	West Anaheim Medical Center	2	2	0	0.00	1.72	0.00	(0.00, 100.0)	Average
	Western Medical Center – Santa Ana	3	3	0	0.00	3.21	0.00	(0.00, 78.87)	Average
	Western Medical Center Hospital – Anaheim	27	22	1	4.55	0.92	10.21	(0.26, 56.76)	Average
Afifi, Hazem Y.	Surgeon Overall	4	3	0	0.00	0.98	0.00	(0.00, 100.0)	Average
	Fountain Valley Regional Hospital and Medical Center – Euclid	2	1	0	0.00	1.48	0.00	(0.00, 100.0)	Average
	Western Medical Center Hospital – Anaheim	2	2	0	0.00	0.73	0.00	(0.00, 100.0)	Average
Aharon, Alon	Surgeon Overall	2	2	0	0.00	0.37	0.00	(0.00, 100.0)	Average
	Washington Hospital – Fremont	2	2	0	0.00	0.37	0.00	(0.00, 100.0)	Average
Al-Dossari, Ghannam A.	Surgeon Overall	6	6	1	16.67	0.78	43.88	(1.11, 100.0)	Average
	UCSF Medical Center	6	6	1	16.67	0.78	43.88	(1.11, 100.0)	Average
Alyono, David	Surgeon Overall	162	121	0	0.00	1.60	0.00	(0.00, 3.91)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Alyono, David (continued)	Kaiser Foundation Hospital – Santa Clara	158	118	0	0.00	1.61	0.00	(0.00, 4.00)	Average
	Mercy General Hospital	4	3	0	0.00	1.43	0.00	(0.00, 100.0)	Average
Anastassiou, Peter T.	Surgeon Overall	8	7	0	0.00	4.23	0.00	(0.00, 25.68)	Average
	Alta Bates Summit Medical Center – Summit Campus	1	1	0	0.00	2.98	0.00	(0.00, 100.0)	Average
	Seton Medical Center	3	2	0	0.00	11.05	0.00	(0.00, 34.38)	Average
	Sutter Medical Center of Santa Rosa	4	4	0	0.00	1.13	0.00	(0.00, 100.0)	Average
Araim, Leheb H.	Surgeon Overall	151	138	4	2.90	1.47	4.06	(1.10, 10.38)	Average
	Kaweah Delta Medical Center	151	138	4	2.90	1.47	4.06	(1.10, 10.38)	Average
Ardehali, Abbas	Surgeon Overall	150	83	0	0.00	1.54	0.00	(0.00, 5.93)	Average
	Ronald Reagan UCLA Medical Center	150	83	0	0.00	1.54	0.00	(0.00, 5.93)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Atiya, Azmi	Surgeon Overall	133	114	5	4.39	2.25	4.02	(1.30, 9.37)	Average
	Henry Mayo Newhall Memorial Hospital	1	1	0	0.00	1.00	0.00	(0.00, 100.0)	Average
	Northridge Hospital Medical Center	76	68	3	4.41	2.16	4.21	(0.87, 12.27)	Average
	Providence Holy Cross Medical Center	34	29	0	0.00	2.66	0.00	(0.00, 9.86)	Average
	Providence Tarzana Medical Center	3	2	0	0.00	1.40	0.00	(0.00, 100.0)	Average
	Valley Presbyterian Hospital	11	7	1	14.29	1.53	19.23	(0.49, 100.0)	Average
	West Hills Hospital and Medical Center	8	7	1	14.29	2.54	11.61	(0.29, 64.56)	Average
Atkins, Broadus Z.	Surgeon Overall	31	24	1	4.17	1.64	5.23	(0.13, 29.08)	Average
	UC Davis Medical Center	31	24	1	4.17	1.64	5.23	(0.13, 29.08)	Average
Azakie, Anthony	Surgeon Overall	1	0	.	.	.	.		Not Applicable
	Kaiser Foundation Hospital – San Francisco	1	0	.	.	.	.		Not Applicable

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Badduke, Brian R.	Surgeon Overall	22	22	0	0.00	3.49	0.00	(0.00, 9.91)	Average
	Washington Hospital – Fremont	22	22	0	0.00	3.49	0.00	(0.00, 9.91)	Average
Baker, Craig J.	Surgeon Overall	156	89	3	3.37	1.31	5.29	(1.09, 15.43)	Average
	Huntington Memorial Hospital	10	7	1	14.29	1.18	25.08	(0.63, 100.0)	Average
	Keck Hospital of USC	87	40	0	0.00	1.83	0.00	(0.00, 10.38)	Average
	Los Angeles County/ University of Southern California Medical Center	59	42	2	4.76	0.85	11.61	(1.40, 41.85)	Average
Baladi, Naoum	Surgeon Overall	32	25	1	4.00	1.75	4.71	(0.12, 26.19)	Average
	Seton Medical Center	31	24	1	4.17	1.78	4.83	(0.12, 26.87)	Average
	St. Mary's Medical Center – San Francisco	1	1	0	0.00	1.10	0.00	(0.00, 100.0)	Average
Baradaran, Sam	Surgeon Overall	121	80	0	0.00	1.62	0.00	(0.00, 5.86)	Average
	Scripps Memorial Hospital – La Jolla	102	71	0	0.00	1.69	0.00	(0.00, 6.32)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Baradarian, Sam (continued)	Sharp Memorial Hospital	19	9	0	0.00	1.05	0.00	(0.00, 80.79)	Average
Baumgartner, Fritz	Surgeon Overall	12	10	0	0.00	2.69	0.00	(0.00, 28.20)	Average
	Lakewood Regional Medical Center	1	1	0	0.00	7.54	0.00	(0.00, 100.0)	Average
	Mercy Medical Center – Redding	11	9	0	0.00	2.16	0.00	(0.00, 39.17)	Average
Benharash, Peyman	Surgeon Overall	2	1	0	0.00	1.07	0.00	(0.00, 100.0)	Average
	Ronald Reagan UCLA Medical Center	2	1	0	0.00	1.07	0.00	(0.00, 100.0)	Average
Bethencourt, Daniel M.	Surgeon Overall	185	145	3	2.07	2.00	2.13	(0.44, 6.21)	Average
	Lakewood Regional Medical Center	7	3	0	0.00	5.29	0.00	(0.00, 47.85)	Average
	Long Beach Memorial Medical Center	137	108	3	2.78	2.23	2.57	(0.53, 7.49)	Average
	Orange Coast Memorial Medical Center	41	34	0	0.00	0.99	0.00	(0.00, 22.48)	Average
Beygui, Ramin	Surgeon Overall	69	48	1	2.08	3.76	1.15	(0.03, 6.37)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Beygui, Ramin (continued)	El Camino Hospital	39	22	1	4.55	3.33	2.82	(0.07, 15.67)	Average
	Stanford Hospital	30	26	0	0.00	4.11	0.00	(0.00, 7.10)	Average
Birnbaum, Peter L.	Surgeon Overall	199	151	2	1.32	1.60	1.71	(0.21, 6.16)	Average
	Community Regional Medical Center – Fresno	49	36	0	0.00	1.44	0.00	(0.00, 14.69)	Average
	Dominican Hospital – Santa Cruz/Soquel	2	2	0	0.00	0.55	0.00	(0.00, 100.0)	Average
	Fresno Heart and Surgical Center	123	92	2	2.17	1.69	2.65	(0.32, 9.55)	Average
	St. Agnes Medical Center	25	21	0	0.00	1.57	0.00	(0.00, 23.06)	Average
Biswas, Shankha S.	Surgeon Overall	199	165	3	1.82	1.95	1.93	(0.40, 5.62)	Average
	Riverside Community Hospital	162	132	1	0.76	1.92	0.82	(0.02, 4.54)	Average
	San Antonio Community Hospital	37	33	2	6.06	2.08	6.01	(0.73, 21.68)	Average
Bolton, Joe	Surgeon Overall	72	68	6	8.82	2.35	7.75	(2.84, 16.82)	Worse
	Emanuel Medical Center	1	1	0	0.00	0.55	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Bolton, Joe (continued)	St. Agnes Medical Center	71	67	6	8.96	2.38	7.77	(2.85, 16.88)	Worse
Bowdish, Michael E.	Surgeon Overall	74	49	2	4.08	1.15	7.34	(0.89, 26.44)	Average
	Huntington Memorial Hospital	6	5	0	0.00	0.89	0.00	(0.00, 100.0)	Average
	Keck Hospital of USC	16	5	1	20.00	4.61	8.95	(0.23, 49.75)	Average
	Los Angeles County/ University of Southern California Medical Center	52	39	1	2.56	0.74	7.17	(0.18, 39.87)	Average
Boyd, Walter D.	Surgeon Overall	100	81	0	0.00	1.49	0.00	(0.00, 6.28)	Average
	UC Davis Medical Center	100	81	0	0.00	1.49	0.00	(0.00, 6.28)	Average
Brewster, Scot A.	Surgeon Overall	172	112	0	0.00	2.17	0.00	(0.00, 3.13)	Average
	Scripps Green Hospital	3	1	0	0.00	1.72	0.00	(0.00, 100.0)	Average
	Scripps Memorial Hospital – La Jolla	169	111	0	0.00	2.17	0.00	(0.00, 3.15)	Average
Buehler, Donald L.	Surgeon Overall	30	18	0	0.00	1.64	0.00	(0.00, 25.76)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Buehler, Donald L. (continued)	Scripps Memorial Hospital – La Jolla	30	18	0	0.00	1.64	0.00	(0.00, 25.76)	Average
Burdon, Thomas A.	Surgeon Overall	1	1	0	0.00	0.27	0.00	(0.00, 100.0)	Average
	Stanford Hospital	1	1	0	0.00	0.27	0.00	(0.00, 100.0)	Average
Bushnell, Lamar J.	Surgeon Overall	63	57	3	5.26	3.36	3.23	(0.66, 9.42)	Average
	Community Memorial Hospital of San Buenaventura	63	57	3	5.26	3.36	3.23	(0.66, 9.42)	Average
Caffarelli, Anthony	Surgeon Overall	122	73	0	0.00	3.77	0.00	(0.00, 2.76)	Average
	Hoag Memorial Hospital Presbyterian	122	73	0	0.00	3.77	0.00	(0.00, 2.76)	Average
Cain, Brian S.	Surgeon Overall	246	189	5	2.65	1.37	3.98	(1.29, 9.27)	Average
	Kaiser Foundation Hospital – San Francisco	242	187	5	2.67	1.38	4.00	(1.30, 9.32)	Average
	Mercy General Hospital	4	2	0	0.00	0.74	0.00	(0.00, 100.0)	Average
Caminha, Sergio D.	Surgeon Overall	140	126	1	0.79	2.12	0.77	(0.02, 4.30)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Caminha, Sergio D. (continued)	Kaweah Delta Medical Center	140	126	1	0.79	2.12	0.77	(0.02, 4.30)	Average
Canvasser, David A.	Surgeon Overall	129	101	1	0.99	2.22	0.92	(0.02, 5.13)	Average
	French Hospital Medical Center	85	62	1	1.61	2.85	1.17	(0.03, 6.49)	Average
	Marian Medical Center	44	39	0	0.00	1.20	0.00	(0.00, 16.18)	Average
Capouya, Eli R.	Surgeon Overall	206	168	4	2.38	1.98	2.48	(0.67, 6.34)	Average
	Citrus Valley Medical Center – IC Campus	13	9	1	11.11	1.65	13.91	(0.35, 77.31)	Average
	Glendale Adventist Medical Center – Wilson Terrace	89	72	2	2.78	2.06	2.79	(0.34, 10.04)	Average
	Good Samaritan Hospital – Los Angeles	41	39	1	2.56	2.37	2.23	(0.06, 12.42)	Average
	Huntington Memorial Hospital	22	15	0	0.00	1.60	0.00	(0.00, 31.59)	Average
	Methodist Hospital of Southern California	29	24	0	0.00	1.98	0.00	(0.00, 15.99)	Average
	Providence St. Joseph Medical Center	8	6	0	0.00	0.56	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Capouya, Eli R. (continued)	St. Vincent Medical Center	4	3	0	0.00	0.78	0.00	(0.00, 100.0)	Average
Castro, Luis J.	Surgeon Overall	157	69	1	1.45	2.42	1.24	(0.03, 6.89)	Average
	California Pacific Medical Center – Pacific Campus	20	6	0	0.00	1.88	0.00	(0.00, 67.45)	Average
	Community Hospital Monterey Peninsula	2	1	0	0.00	0.40	0.00	(0.00, 100.0)	Average
	Peninsula Medical Center	4	2	0	0.00	0.51	0.00	(0.00, 100.0)	Average
	Sequoia Hospital	131	60	1	1.67	2.57	1.34	(0.03, 7.45)	Average
Chammas, Joseph H.	Surgeon Overall	97	74	4	5.41	1.76	6.33	(1.72, 16.16)	Average
	Sharp Memorial Hospital	97	74	4	5.41	1.76	6.33	(1.72, 16.16)	Average
Chaudhry, Pervaiz A.	Surgeon Overall	403	344	10	2.91	2.03	2.96	(1.42, 5.44)	Average
	Community Regional Medical Center – Fresno	300	258	9	3.49	2.11	3.41	(1.56, 6.46)	Average
	Fresno Heart and Surgical Center	51	42	1	2.38	1.62	3.04	(0.08, 16.89)	Average
	St. Agnes Medical Center	52	44	0	0.00	1.91	0.00	(0.00, 9.03)	Average
Chen, Raymond H.	Surgeon Overall	229	219	3	1.37	1.57	1.80	(0.37, 5.26)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Chen, Raymond H. (continued)	Kaiser Foundation Hospital – Sunset	229	219	3	1.37	1.57	1.80	(0.37, 5.26)	Average
Cheng, Wen	Surgeon Overall	17	11	0	0.00	1.35	0.00	(0.00, 51.01)	Average
	Cedars Sinai Medical Center	17	11	0	0.00	1.35	0.00	(0.00, 51.01)	Average
Cohen, Robbin G.	Surgeon Overall	159	112	0	0.00	1.45	0.00	(0.00, 4.68)	Average
	Huntington Memorial Hospital	149	109	0	0.00	1.47	0.00	(0.00, 4.73)	Average
	Keck Hospital of USC	9	2	0	0.00	0.57	0.00	(0.00, 100.0)	Average
	Los Angeles County/ University of Southern California Medical Center	1	1	0	0.00	0.70	0.00	(0.00, 100.0)	Average
Cohler, Larry F.	Surgeon Overall	40	39	1	2.56	3.67	1.44	(0.04, 8.01)	Average
	Community Regional Medical Center – Fresno	28	27	0	0.00	1.89	0.00	(0.00, 14.89)	Average
	Fresno Heart and Surgical Center	2	2	0	0.00	1.12	0.00	(0.00, 100.0)	Average
	St. Agnes Medical Center	10	10	1	10.00	8.99	2.30	(0.06, 12.76)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Coletta, Joelle	Surgeon Overall	5	3	0	0.00	0.85	0.00	(0.00, 100.0)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	4	2	0	0.00	0.42	0.00	(0.00, 100.0)	Average
	UC San Diego Health – Hillcrest Medical Center	1	1	0	0.00	1.73	0.00	(0.00, 100.0)	Average
Concepcion, Noel L.	Surgeon Overall	312	243	2	0.82	2.61	0.65	(0.08, 2.35)	Average
	Doctors Medical Center	305	236	2	0.85	2.60	0.67	(0.08, 2.42)	Average
	Memorial Hospital Medical Center – Modesto	7	7	0	0.00	2.63	0.00	(0.00, 41.34)	Average
Connor, Ann R.	Surgeon Overall	1	1	0	0.00	1.38	0.00	(0.00, 100.0)	Average
	Emanuel Medical Center	1	1	0	0.00	1.38	0.00	(0.00, 100.0)	Average
Copeland, Jack	Surgeon Overall	13	10	1	10.00	2.92	7.08	(0.18, 39.35)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	13	10	1	10.00	2.92	7.08	(0.18, 39.35)	Average
Cummings, Steven P.	Surgeon Overall	45	40	1	2.50	2.06	2.51	(0.06, 13.94)	Average
	Fresno Heart and Surgical Center	1	1	0	0.00	2.42	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Cummings, Steven P. (continued)	St. Agnes Medical Center	44	39	1	2.56	2.05	2.58	(0.07, 14.36)	Average
Cunningham, Mark J.	Surgeon Overall	131	51	0	0.00	1.60	0.00	(0.00, 9.29)	Average
	Huntington Memorial Hospital	8	6	0	0.00	3.54	0.00	(0.00, 35.80)	Average
	Keck Hospital of USC	92	23	0	0.00	1.95	0.00	(0.00, 16.94)	Average
	Los Angeles County/ University of Southern California Medical Center	31	22	0	0.00	0.71	0.00	(0.00, 48.47)	Average
Daniel, Subashini	Surgeon Overall	74	68	2	2.94	1.94	3.12	(0.38, 11.26)	Average
	Community Regional Medical Center – Fresno	21	19	1	5.26	2.32	4.68	(0.12, 26.03)	Average
	Fresno Heart and Surgical Center	10	9	0	0.00	1.87	0.00	(0.00, 45.05)	Average
	Salinas Valley Memorial Hospital	38	35	1	2.86	1.57	3.76	(0.10, 20.91)	Average
	St. Agnes Medical Center	5	5	0	0.00	3.28	0.00	(0.00, 46.38)	Average
Danielson, Daren S.	Surgeon Overall	40	35	1	2.86	2.16	2.73	(0.07, 15.20)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Danielson, Daren S. (continued)	Sutter Memorial Hospital	37	33	1	3.03	2.24	2.79	(0.07, 15.51)	Average
	UC Davis Medical Center	3	2	0	0.00	0.77	0.00	(0.00, 100.0)	Average
Darbinian, Sevak H.	Surgeon Overall	261	207	4	1.93	2.10	1.90	(0.52, 4.84)	Average
	Mission Hospital Regional Medical Center	229	179	4	2.23	2.17	2.13	(0.58, 5.43)	Average
	Saddleback Memorial Medical Center	32	28	0	0.00	1.70	0.00	(0.00, 16.00)	Average
Davtyan, Hakob G.	Surgeon Overall	253	200	0	0.00	2.00	0.00	(0.00, 1.90)	Better
	Riverside Community Hospital	74	56	0	0.00	2.03	0.00	(0.00, 6.67)	Average
	St. Bernardine Medical Center	125	100	0	0.00	2.10	0.00	(0.00, 3.61)	Average
	St. Mary Regional Medical Center	54	44	0	0.00	1.71	0.00	(0.00, 10.12)	Average
Declusin, Richard J.	Surgeon Overall	107	73	0	0.00	1.60	0.00	(0.00, 6.50)	Average
	Community Memorial Hospital of San Buenaventura	8	4	0	0.00	2.34	0.00	(0.00, 81.11)	Average
	Los Robles Hospital and Medical Center	9	4	0	0.00	1.05	0.00	(0.00, 100.0)	Average
	St. John's Regional Medical Center	90	65	0	0.00	1.59	0.00	(0.00, 7.35)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Deeik, Ramzi K.	Surgeon Overall	133	110	2	1.82	1.88	2.00	(0.24, 7.20)	Average
	North Bay Medical Center	34	32	1	3.13	1.88	3.43	(0.09, 19.08)	Average
	Queen of the Valley Hospital – Napa	6	4	0	0.00	2.02	0.00	(0.00, 94.01)	Average
	Santa Rosa Memorial Hospital – Montgomery	93	74	1	1.35	1.87	1.49	(0.04, 8.29)	Average
Defilippi, Vincent J.	Surgeon Overall	160	131	4	3.05	2.44	2.58	(0.70, 6.59)	Average
	Salinas Valley Memorial Hospital	160	131	4	3.05	2.44	2.58	(0.70, 6.59)	Average
Dein, John R.	Surgeon Overall	282	205	3	1.46	1.67	1.81	(0.37, 5.28)	Average
	Mercy General Hospital	268	196	3	1.53	1.56	2.03	(0.42, 5.91)	Average
	Mercy San Juan Hospital	14	9	0	0.00	4.03	0.00	(0.00, 20.98)	Average
Del Campo, Carlos	Surgeon Overall	60	49	3	6.12	2.07	6.11	(1.26, 17.81)	Average
	St. Jude Medical Center	60	49	3	6.12	2.07	6.11	(1.26, 17.81)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Delrio, Michael J.	Surgeon Overall	34	28	1	3.57	1.97	3.75	(0.09, 20.85)	Average
	Palomar Medical Center	1	1	0	0.00	1.29	0.00	(0.00, 100.0)	Average
	Riverside Community Hospital	33	27	1	3.70	1.99	3.84	(0.10, 21.35)	Average
Dembitsky, Walter P.	Surgeon Overall	105	43	0	0.00	1.68	0.00	(0.00, 10.52)	Average
	Sharp Memorial Hospital	105	43	0	0.00	1.68	0.00	(0.00, 10.52)	Average
Dhar, Naveen	Surgeon Overall	36	29	0	0.00	2.35	0.00	(0.00, 11.14)	Average
	AHMC Anaheim Regional Medical Center	1	1	0	0.00	0.65	0.00	(0.00, 100.0)	Average
	Fountain Valley Regional Hospital and Medical Center – Euclid	31	26	0	0.00	1.89	0.00	(0.00, 15.47)	Average
	West Anaheim Medical Center	1	0	.	.	.	.		Not Applicable
	Western Medical Center – Santa Ana	2	1	0	0.00	5.22	0.00	(0.00, 100.0)	Average
	Western Medical Center Hospital – Anaheim	1	1	0	0.00	13.23	0.00	(0.00, 57.45)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Dharan, Murali	Surgeon Overall	181	139	1	0.72	1.62	0.92	(0.02, 5.10)	Average
	John Muir Medical Center - Concord Campus	106	79	1	1.27	1.64	1.59	(0.04, 8.86)	Average
	San Ramon Regional Medical Center	37	31	0	0.00	1.35	0.00	(0.00, 18.18)	Average
	ValleyCare Medical Center	38	29	0	0.00	1.85	0.00	(0.00, 14.18)	Average
Dhawan, Puneet	Surgeon Overall	142	108	0	0.00	1.65	0.00	(0.00, 4.26)	Average
	Los Angeles County/ Harbor - UCLA Medical Center	74	57	0	0.00	1.75	0.00	(0.00, 7.64)	Average
	St. Joseph Hospital – Orange	1	1	0	0.00	1.38	0.00	(0.00, 100.0)	Average
	St. Jude Medical Center	67	50	0	0.00	1.55	0.00	(0.00, 9.80)	Average
Dhillon, Jatinder S.	Surgeon Overall	135	112	2	1.79	1.97	1.87	(0.23, 6.76)	Average
	John Muir Medical Center – Concord Campus	116	93	2	2.15	2.05	2.17	(0.26, 7.82)	Average
	San Ramon Regional Medical Center	5	5	0	0.00	1.46	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Dhillon, Jatinder S. (continued)	ValleyCare Medical Center	14	14	0	0.00	1.62	0.00	(0.00, 33.43)	Average
Dunnington, Gansevoort	Surgeon Overall	73	41	0	0.00	2.15	0.00	(0.00, 8.61)	Average
	El Camino Hospital	61	36	0	0.00	1.91	0.00	(0.00, 11.04)	Average
	Emanuel Medical Center	2	1	0	0.00	1.34	0.00	(0.00, 100.0)	Average
	Stanford Hospital	10	4	0	0.00	4.53	0.00	(0.00, 41.96)	Average
Durzinsky, Dennis S.	Surgeon Overall	63	54	0	0.00	1.44	0.00	(0.00, 9.75)	Average
	Kaiser Foundation Hospital – San Francisco	63	54	0	0.00	1.44	0.00	(0.00, 9.75)	Average
Edwards, Phyllis A.	Surgeon Overall	23	19	1	5.26	2.87	3.79	(0.10, 21.08)	Average
	Kaweah Delta Medical Center	23	19	1	5.26	2.87	3.79	(0.10, 21.08)	Average
Egrie, Glenn D.	Surgeon Overall	106	85	1	1.18	1.89	1.29	(0.03, 7.15)	Average
	California Pacific Medical Center – Pacific Campus	106	85	1	1.18	1.89	1.29	(0.03, 7.15)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Ehrman, Walter J.	Surgeon Overall	28	27	3	11.11	2.98	7.70	(1.59, 22.46)	Average
	Desert Regional Medical Center	28	27	3	11.11	2.98	7.70	(1.59, 22.46)	Average
Ellis, Robert J.	Surgeon Overall	47	43	0	0.00	1.80	0.00	(0.00, 9.83)	Average
	Marin General Hospital	46	42	0	0.00	1.80	0.00	(0.00, 10.07)	Average
	St. Mary's Medical Center – San Francisco	1	1	0	0.00	1.86	0.00	(0.00, 100.0)	Average
Esmailian, Fardad	Surgeon Overall	90	59	2	3.39	1.46	4.80	(0.58, 17.30)	Average
	Cedars Sinai Medical Center	89	58	2	3.45	1.46	4.89	(0.59, 17.62)	Average
	Ronald Reagan UCLA Medical Center	1	1	0	0.00	1.56	0.00	(0.00, 100.0)	Average
Estioko, Manuel R.	Surgeon Overall	12	9	1	11.11	3.00	7.66	(0.19, 42.55)	Average
	Torrance Memorial Medical Center	12	9	1	11.11	3.00	7.66	(0.19, 42.55)	Average
	Western Medical Center Hospital – Anaheim	5	5	0	0.00	2.25	0.00	(0.00, 67.47)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Faber, Luke A.	Surgeon Overall	110	81	4	4.94	1.99	5.13	(1.39, 13.11)	Average
	French Hospital Medical Center	71	48	1	2.08	1.97	2.19	(0.06, 12.17)	Average
	Marian Medical Center	39	33	3	9.09	2.02	9.30	(1.91, 27.11)	Average
Faraci, Philip A.	Surgeon Overall	134	107	4	3.74	2.75	2.81	(0.76, 7.18)	Average
	Enloe Medical Center – Esplanade Campus	5	4	0	0.00	0.79	0.00	(0.00, 100.0)	Average
	Lakewood Regional Medical Center	69	55	2	3.64	2.71	2.77	(0.33, 9.97)	Average
	Long Beach Memorial Medical Center	48	38	1	2.63	3.02	1.80	(0.05, 10.01)	Average
	Orange Coast Memorial Medical Center	9	8	1	12.50	3.02	8.55	(0.22, 47.54)	Average
	Shasta Regional Medical Center	3	2	0	0.00	1.28	0.00	(0.00, 100.0)	Average
Fee, Henry J.	Surgeon Overall	37	30	0	0.00	3.48	0.00	(0.00, 7.28)	Average
	Good Samaritan Hospital – San Jose	24	19	0	0.00	4.46	0.00	(0.00, 8.98)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Fee, Henry J. (continued)	O'Connor Hospital – San Jose	13	11	0	0.00	1.79	0.00	(0.00, 38.62)	Average
Felahy, Isam	Surgeon Overall	77	70	2	2.86	2.47	2.39	(0.29, 8.60)	Average
	Dameron Hospital	9	9	0	0.00	1.39	0.00	(0.00, 60.55)	Average
	St. Joseph's Medical Center of Stockton	68	61	2	3.28	2.63	2.57	(0.31, 9.27)	Average
Fischbein, Michael P.	Surgeon Overall	71	43	0	0.00	1.62	0.00	(0.00, 10.93)	Average
	Stanford Hospital	71	43	0	0.00	1.62	0.00	(0.00, 10.93)	Average
Fleischman, Fernando	Surgeon Overall	141	124	0	0.00	0.72	0.00	(0.00, 8.56)	Average
	Huntington Memorial Hospital	1	1	0	0.00	0.94	0.00	(0.00, 100.0)	Average
	Keck Hospital of USC	9	5	0	0.00	0.87	0.00	(0.00, 100.0)	Average
	Los Angeles County/ University of Southern California Medical Center	131	118	0	0.00	0.71	0.00	(0.00, 9.10)	Average
Flores, Mona G.	Surgeon Overall	88	70	0	0.00	1.20	0.00	(0.00, 9.01)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Flores, Mona G. (continued)	UC Davis Medical Center	88	70	0	0.00	1.20	0.00	(0.00, 9.01)	Average
Florida, Rosario	Surgeon Overall	125	103	NA	NA	NA	NA	NA	NA
	Loma Linda Murrieta**	1	1	NA	NA	NA	NA	NA	NA
	Loma Linda University Medical Center	124	102	2	1.96	3.13	1.29	(0.16, 4.66)	Average
Folkerth, Theodore L.	Surgeon Overall	133	106	4	3.77	2.67	2.92	(0.79, 7.47)	Average
	Tri-City Medical Center	133	106	4	3.77	2.67	2.92	(0.79, 7.47)	Average
Fontana, Gregory P.	Surgeon Overall	14	10	0	0.00	1.73	0.00	(0.00, 43.83)	Average
	Cedars Sinai Medical Center	14	10	0	0.00	1.73	0.00	(0.00, 43.83)	Average
Freyaldenhoven, Stephen J.	Surgeon Overall	113	81	1	1.23	2.97	0.86	(0.02, 4.78)	Average
	French Hospital Medical Center	48	31	0	0.00	2.46	0.00	(0.00, 9.98)	Average
	Marian Medical Center	65	50	1	2.00	3.28	1.26	(0.03, 7.00)	Average
Fung, Lit K.	Surgeon Overall	333	251	4	1.59	2.03	1.62	(0.44, 4.14)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Fung, Lit K. (continued)	Doctors Medical Center	1	0	.	.	.	.		Not Applicable
	Memorial Hospital Medical Center – Modesto	332	251	4	1.59	2.03	1.62	(0.44, 4.14)	Average
Gates, Richard N.	Surgeon Overall	82	61	2	3.28	1.79	3.78	(0.46, 13.62)	Average
	Saddleback Memorial Medical Center	1	0	.	.	.	.		Not Applicable
	St. Joseph Hospital – Orange	81	61	2	3.28	1.79	3.78	(0.46, 13.62)	Average
Gaudiani, Vincent A.	Surgeon Overall	90	38	0	0.00	2.19	0.00	(0.00, 9.15)	Average
	California Pacific Medical Center – Pacific Campus	29	11	0	0.00	1.33	0.00	(0.00, 51.76)	Average
	Community Hospital Monterey Peninsula	22	7	0	0.00	2.48	0.00	(0.00, 43.72)	Average
	El Camino Hospital	16	9	0	0.00	1.33	0.00	(0.00, 63.35)	Average
	Sequoia Hospital	23	11	0	0.00	3.54	0.00	(0.00, 19.50)	Average
Ghaly, Aziz	Surgeon Overall	100	91	NA	NA	NA	NA	NA	NA

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Ghaly, Aziz (continued)	Loma Linda Murrieta**	4	4	NA	NA	NA	NA	NA	NA
	Loma Linda University Medical Center	96	87	4	4.60	2.03	4.67	(1.27, 11.93)	Average
Gharavi, Mohammad	Surgeon Overall	221	164	5	3.05	1.87	3.37	(1.09, 7.86)	Average
	Los Robles Hospital and Medical Center	88	57	2	3.51	1.97	3.68	(0.44, 13.26)	Average
	Providence Tarzana Medical Center	67	53	1	1.89	2.16	1.81	(0.05, 10.04)	Average
	West Hills Hospital and Medical Center	66	54	2	3.70	1.47	5.20	(0.63, 18.73)	Average
Gheissari, Ali	Surgeon Overall	197	151	4	2.65	2.11	2.59	(0.70, 6.61)	Average
	Citrus Valley Medical Center – IC Campus	2	2	0	0.00	2.05	0.00	(0.00, 100.0)	Average
	Glendale Adventist Medical Center – Wilson Terrace	7	5	0	0.00	1.11	0.00	(0.00, 100.0)	Average
	Good Samaritan Hospital – Los Angeles	166	127	4	3.15	2.16	3.01	(0.82, 7.68)	Average
	Methodist Hospital of Southern California	4	4	0	0.00	3.44	0.00	(0.00, 55.22)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Gheissari, Ali (continued)	Providence St. Joseph Medical Center	7	4	0	0.00	2.16	0.00	(0.00, 88.11)	Average
	St. Vincent Medical Center	11	9	0	0.00	1.40	0.00	(0.00, 60.25)	Average
Gibson, Christopher F.	Surgeon Overall	274	236	6	2.54	1.87	2.81	(1.03, 6.10)	Average
	Riverside Community Hospital	34	31	1	3.23	2.12	3.14	(0.08, 17.43)	Average
	St. Bernardine Medical Center	178	152	4	2.63	1.95	2.79	(0.76, 7.12)	Average
	St. Mary Regional Medical Center	62	53	1	1.89	1.49	2.61	(0.07, 14.51)	Average
Giritsky, Alexander S.	Surgeon Overall	35	27	1	3.70	2.05	3.73	(0.09, 20.74)	Average
	Scripps Memorial Hospital – La Jolla	35	27	1	3.70	2.05	3.73	(0.09, 20.74)	Average
Golts, Eugene	Surgeon Overall	73	49	0	0.00	1.34	0.00	(0.00, 11.57)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	68	44	0	0.00	1.32	0.00	(0.00, 13.12)	Average
	UC San Diego Health – Hillcrest Medical Center	5	5	0	0.00	1.55	0.00	(0.00, 97.74)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Gomez Abraham, Jesus A.	Surgeon Overall	1	0	.	.	.	.		Not Applicable
	Emanuel Medical Center	1	0	.	.	.	.		Not Applicable
Gordon, Robert T.	Surgeon Overall	166	109	3	2.75	1.62	3.51	(0.72, 10.23)	Average
	Kaiser Foundation Hospital – Santa Clara	166	109	3	2.75	1.62	3.51	(0.72, 10.23)	Average
Gottner, Robert J.	Surgeon Overall	146	117	2	1.71	2.21	1.60	(0.19, 5.76)	Average
	Citrus Valley Medical Center – IC Campus	6	5	0	0.00	1.40	0.00	(0.00, 100.0)	Average
	Glendale Adventist Medical Center – Wilson Terrace	4	3	0	0.00	1.50	0.00	(0.00, 100.0)	Average
	Good Samaritan Hospital - Los Angeles	12	11	0	0.00	2.55	0.00	(0.00, 27.07)	Average
	Methodist Hospital of Southern California	53	41	0	0.00	2.31	0.00	(0.00, 8.02)	Average
	Providence St. Joseph Medical Center	71	57	2	3.51	2.18	3.32	(0.40, 11.98)	Average
Gregory, Richard D.	Surgeon Overall	218	180	3	1.67	2.05	1.68	(0.35, 4.89)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Gregory, Richard D. (continued)	Community Regional Medical Center – Fresno	2	2	0	0.00	0.91	0.00	(0.00, 100.0)	Average
	Fresno Heart and Surgical Center	45	37	0	0.00	1.78	0.00	(0.00, 11.51)	Average
	St. Agnes Medical Center	171	141	3	2.13	2.14	2.06	(0.42, 5.99)	Average
Grewal, Navrose S.	Surgeon Overall	52	50	0	0.00	1.40	0.00	(0.00, 10.83)	Average
	Downey Regional Medical Center	14	14	0	0.00	1.80	0.00	(0.00, 30.15)	Average
	Lakewood Regional Medical Center	20	19	0	0.00	1.38	0.00	(0.00, 29.02)	Average
	Long Beach Memorial Medical Center	8	8	0	0.00	1.41	0.00	(0.00, 67.37)	Average
	Shasta Regional Medical Center	3	3	0	0.00	0.47	0.00	(0.00, 100.0)	Average
	St. Mary Medical Center	6	5	0	0.00	1.05	0.00	(0.00, 100.0)	Average
	UC Irvine Medical Center	1	1	0	0.00	0.85	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Griffith, Patrick K.	Surgeon Overall	125	98	1	1.02	1.67	1.26	(0.03, 7.03)	Average
	Rideout Memorial Hospital	125	98	1	1.02	1.67	1.26	(0.03, 7.03)	Average
Gulati, Rajeev	Surgeon Overall	116	103	1	0.97	2.68	0.75	(0.02, 4.16)	Average
	Pomona Valley Hospital Medical Center	103	91	1	1.10	2.82	0.81	(0.02, 4.48)	Average
	San Antonio Community Hospital	13	12	0	0.00	1.62	0.00	(0.00, 39.01)	Average
Gundry, Steven R.	Surgeon Overall	28	14	0	0.00	2.09	0.00	(0.00, 26.03)	Average
	Desert Regional Medical Center	28	14	0	0.00	2.09	0.00	(0.00, 26.03)	Average
Ha, Richard-Tien V.	Surgeon Overall	86	76	1	1.32	0.84	3.22	(0.08, 17.90)	Average
	Salinas Valley Memorial Hospital	3	3	0	0.00	0.83	0.00	(0.00, 100.0)	Average
	Santa Clara Valley Medical Center	72	68	1	1.47	0.79	3.82	(0.10, 21.26)	Average
	Stanford Hospital	11	5	0	0.00	1.53	0.00	(0.00, 99.40)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Habibipour, Saied	Surgeon Overall	220	186	7	3.76	2.41	3.23	(1.29, 6.63)	Average
	Desert Regional Medical Center	220	186	7	3.76	2.41	3.23	(1.29, 6.63)	Average
Hall, James D.	Surgeon Overall	31	25	1	4.00	2.18	3.79	(0.10, 21.05)	Average
	Providence Little Company of Mary Medical Center – Torrance	31	25	1	4.00	2.18	3.79	(0.10, 21.05)	Average
Harmon, Adam L.	Surgeon Overall	39	32	0	0.00	2.78	0.00	(0.00, 8.53)	Average
	Sequoia Hospital	39	32	0	0.00	2.78	0.00	(0.00, 8.53)	Average
Harper, Baron	Surgeon Overall	114	88	7	7.95	1.86	8.84	(3.55, 18.18)	Worse
	Rideout Memorial Hospital	114	88	7	7.95	1.86	8.84	(3.55, 18.18)	Worse
Hasaniya, Nahidh W.	Surgeon Overall	79	64	NA	NA	NA	NA	NA	NA
	Loma Linda Murrieta**	11	10	NA	NA	NA	NA	NA	NA
	Loma Linda University Medical Center	68	54	0	0.00	1.67	0.00	(0.00, 8.43)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Hemp, James	Surgeon Overall	190	136	1	0.74	1.92	0.79	(0.02, 4.38)	Average
	Scripps Green Hospital	12	8	0	0.00	2.73	0.00	(0.00, 34.84)	Average
	Scripps Memorial Hospital – La Jolla	1	1	0	0.00	3.47	0.00	(0.00, 100.0)	Average
	Scripps Mercy Hospital	177	127	1	0.79	1.86	0.87	(0.02, 4.85)	Average
Hill, Arthur C.	Surgeon Overall	59	51	1	1.96	1.04	3.88	(0.10, 21.55)	Average
	UCSF Medical Center	59	51	1	1.96	1.04	3.88	(0.10, 21.55)	Average
Hodgins, Darren M.	Surgeon Overall	25	24	1	4.17	1.90	4.52	(0.11, 25.13)	Average
	White Memorial Medical Center	25	24	1	4.17	1.90	4.52	(0.11, 25.13)	Average
Holland, David L.	Surgeon Overall	20	18	0	0.00	1.53	0.00	(0.00, 27.55)	Average
	Loma Linda Murrieta	9	9	0	0.00	1.02	0.00	(0.00, 82.99)	Average
	Loma Linda University Medical Center	11	9	0	0.00	2.05	0.00	(0.00, 41.24)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Hood, James S.	Surgeon Overall	128	97	2	2.06	1.07	3.97	(0.48, 14.32)	Average
	Kaiser Foundation Hospital – San Francisco	128	97	2	2.06	1.07	3.97	(0.48, 14.32)	Average
Horan, Siobain M.	Surgeon Overall	24	22	0	0.00	2.79	0.00	(0.00, 12.39)	Average
	Community Memorial Hospital of San Buenaventura	4	4	0	0.00	1.17	0.00	(0.00, 100.0)	Average
	St. John's Regional Medical Center	20	18	0	0.00	3.15	0.00	(0.00, 13.42)	Average
Howden, Frederick M.	Surgeon Overall	89	61	1	1.64	2.25	1.50	(0.04, 8.36)	Average
	Alvarado Hospital Medical Center	69	50	1	2.00	2.47	1.67	(0.04, 9.30)	Average
	Grossmont Hospital	17	8	0	0.00	1.25	0.00	(0.00, 76.15)	Average
	Tri-City Medical Center	3	3	0	0.00	1.30	0.00	(0.00, 100.0)	Average
Huang, Mark W.	Surgeon Overall	94	83	2	2.41	2.73	1.82	(0.22, 6.57)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Huang, Mark W. (continued)	Alvarado Hospital Medical Center	3	3	0	0.00	0.88	0.00	(0.00, 100.0)	Average
	Grossmont Hospital	1	1	0	0.00	0.52	0.00	(0.00, 100.0)	Average
	Sharp Chula Vista Medical Center	90	79	2	2.53	2.83	1.85	(0.22, 6.66)	Average
Huang, Ming-Lu	Surgeon Overall	408	342	3	0.88	1.69	1.07	(0.22, 3.12)	Average
	Beverly Hospital	24	18	0	0.00	2.33	0.00	(0.00, 18.10)	Average
	Citrus Valley Medical Center – IC Campus	159	130	2	1.54	1.69	1.88	(0.23, 6.76)	Average
	Garfield Medical Center	204	177	1	0.56	1.60	0.73	(0.02, 4.04)	Average
	Methodist Hospital of Southern California	21	17	0	0.00	1.93	0.00	(0.00, 23.12)	Average
Huh, Joseph	Surgeon Overall	189	124	3	2.42	1.39	3.61	(0.74, 10.52)	Average
	Mercy General Hospital	189	124	3	2.42	1.39	3.61	(0.74, 10.52)	Average
Hunter, Curtis T.	Surgeon Overall	87	51	1	1.96	2.93	1.38	(0.03, 7.69)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Hunter, Curtis T. (continued)	Ronald Reagan UCLA Medical Center	52	25	1	4.00	3.97	2.08	(0.05, 11.58)	Average
	Santa Monica – UCLA Medical Center and Orthopaedic Hospital	1	1	0	0.00	1.47	0.00	(0.00, 100.0)	Average
	St. John's Health Center	34	25	0	0.00	1.95	0.00	(0.00, 15.61)	Average
Hurwitz, Andrew S.	Surgeon Overall	102	93	1	1.08	1.58	1.40	(0.04, 7.81)	Average
	Glendale Adventist Medical Center – Wilson Terrace	13	10	0	0.00	1.75	0.00	(0.00, 43.54)	Average
	Glendale Memorial Hospital and Health Center	89	83	1	1.20	1.56	1.59	(0.04, 8.86)	Average
Ingram, Michael T.	Surgeon Overall	294	210	4	1.90	1.97	2.00	(0.54, 5.10)	Average
	Sutter Memorial Hospital	294	210	4	1.90	1.97	2.00	(0.54, 5.10)	Average
Iyengar, Sridhara K.	Surgeon Overall	40	36	0	0.00	2.50	0.00	(0.00, 8.43)	Average
	Fountain Valley Regional Hospital and Medical Center –	39	35	0	0.00	2.56	0.00	(0.00, 8.48)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Iyengar, Sridhara K. (continued)	Euclid								
	Saddleback Memorial Medical Center	1	1	0	0.00	0.53	0.00	(0.00, 100.0)	Average
Jacobson, John	Surgeon Overall	33	28	1	3.57	3.28	2.25	(0.06, 12.48)	Average
	St. Helena Hospital	33	28	1	3.57	3.28	2.25	(0.06, 12.48)	Average
Jain, Sarika	Surgeon Overall	115	100	0	0.00	3.38	0.00	(0.00, 2.25)	Average
	Pomona Valley Hospital Medical Center	110	97	0	0.00	3.46	0.00	(0.00, 2.26)	Average
	San Antonio Community Hospital	5	3	0	0.00	0.90	0.00	(0.00, 100.0)	Average
Jamieson, Stuart	Surgeon Overall	2	0	.	.	.	.		Not Applicable
	UC San Diego Health – Sulpizio Cardiovascular Center	2	0	.	.	.	.		Not Applicable
Jones, Blanding U.	Surgeon Overall	345	322	4	1.24	1.76	1.45	(0.40, 3.72)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Jones, Blanding U. (continued)	Kaiser Foundation Hospital – Sunset	264	246	3	1.22	1.80	1.40	(0.29, 4.07)	Average
	St. Bernardine Medical Center	81	76	1	1.32	1.63	1.67	(0.04, 9.26)	Average
Joyo, Colin I.	Surgeon Overall	91	68	1	1.47	2.58	1.18	(0.03, 6.53)	Average
	Hoag Memorial Hospital Presbyterian	91	68	1	1.47	2.58	1.18	(0.03, 6.53)	Average
Kallin, Kristopher	Surgeon Overall	1	0	.	.	.	.		Not Applicable
	Kaiser Foundation Hospital – Sunset	1	0	.	.	.	.		Not Applicable
Kamlot, Andreas	Surgeon Overall	124	105	1	0.95	1.72	1.14	(0.03, 6.36)	Average
	John Muir Medical Center – Concord Campus	118	100	1	1.00	1.66	1.24	(0.03, 6.91)	Average
	San Ramon Regional Medical Center	6	5	0	0.00	2.86	0.00	(0.00, 53.16)	Average
Kaplon, Richard J.	Surgeon Overall	310	203	4	1.97	1.81	2.24	(0.61, 5.73)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Kaplon, Richard J. (continued)	Mercy General Hospital	291	189	4	2.12	1.86	2.36	(0.64, 6.02)	Average
	Mercy San Juan Hospital	19	14	0	0.00	1.25	0.00	(0.00, 43.45)	Average
Kass, Robert M.	Surgeon Overall	47	35	0	0.00	1.76	0.00	(0.00, 12.33)	Average
	Cedars Sinai Medical Center	47	35	0	0.00	1.76	0.00	(0.00, 12.33)	Average
Khan, Junaid H.	Surgeon Overall	204	149	4	2.68	2.29	2.42	(0.66, 6.18)	Average
	Alta Bates Summit Medical Center – Summit Campus	204	149	4	2.68	2.29	2.42	(0.66, 6.18)	Average
Khan, Tanveer	Surgeon Overall	110	91	2	2.20	2.06	2.21	(0.27, 7.95)	Average
	John Muir Medical Center – Concord Campus	80	65	1	1.54	1.95	1.63	(0.04, 9.04)	Average
	San Ramon Regional Medical Center	12	12	0	0.00	1.52	0.00	(0.00, 41.62)	Average
	ValleyCare Medical Center	18	14	1	7.14	3.00	4.92	(0.12, 27.36)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Khoynezhad, Ali Khoynezhad, Ali (continued)	Surgeon Overall	34	20	1	5.00	1.90	5.43	(0.14, 30.19)	Average
	Cedars Sinai Medical Center	34	20	1	5.00	1.90	5.43	(0.14, 30.19)	Average
Khwaja, Shamsuddin	Surgeon Overall	291	248	7	2.82	1.80	3.23	(1.30, 6.64)	Average
	Community Regional Medical Center – Fresno	99	82	4	4.88	2.13	4.73	(1.28, 12.07)	Average
	Fresno Heart and Surgical Center	131	116	1	0.86	1.66	1.07	(0.03, 5.94)	Average
	St. Agnes Medical Center	61	50	2	4.00	1.59	5.20	(0.63, 18.72)	Average
Kincade, Robert C.	Surgeon Overall	296	219	0	0.00	2.14	0.00	(0.00, 1.62)	Better
	Sutter Memorial Hospital	296	219	0	0.00	2.14	0.00	(0.00, 1.62)	Better
Klingman, Robert R.	Surgeon Overall	180	151	2	1.32	2.34	1.17	(0.14, 4.20)	Average
	North Bay Medical Center	35	33	0	0.00	1.60	0.00	(0.00, 14.36)	Average
	Queen of the Valley Hospital - Napa	129	104	1	0.96	2.57	0.77	(0.02, 4.29)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Klingman, Robert R. (continued)	Santa Rosa Memorial Hospital – Montgomery	16	14	1	7.14	2.40	6.14	(0.16, 34.11)	Average
Kochamba, Gary S.	Surgeon Overall	251	163	2	1.23	1.81	1.40	(0.17, 5.04)	Average
	Kaiser Foundation Hospital – Sunset	251	163	2	1.23	1.81	1.40	(0.17, 5.04)	Average
Korver, Keith F.	Surgeon Overall	282	210	4	1.90	1.38	2.85	(0.78, 7.29)	Average
	Marin General Hospital	55	42	0	0.00	1.50	0.00	(0.00, 12.10)	Average
	Santa Rosa Memorial Hospital – Montgomery	58	54	3	5.56	1.69	6.77	(1.39, 19.74)	Average
	St. Helena Hospital	14	13	0	0.00	1.14	0.00	(0.00, 51.26)	Average
	Sutter Medical Center of Santa Rosa	155	101	1	0.99	1.19	1.71	(0.04, 9.53)	Average
Koumjian, Michael P.	Surgeon Overall	169	144	4	2.78	2.68	2.14	(0.58, 5.47)	Average
	Alvarado Hospital Medical Center	8	7	0	0.00	1.55	0.00	(0.00, 69.86)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Koumjian, Michael P. (continued)	Grossmont Hospital	115	95	1	1.05	3.13	0.69	(0.02, 3.86)	Average
	Scripps Mercy Hospital	22	21	1	4.76	2.03	4.84	(0.12, 26.93)	Average
	Sharp Chula Vista Medical Center	24	21	2	9.52	1.66	11.82	(1.43, 42.60)	Average
Kwon, Murray	Surgeon Overall	42	23	1	4.35	4.66	1.93	(0.05, 10.71)	Average
	Ronald Reagan UCLA Medical Center	42	23	1	4.35	4.66	1.93	(0.05, 10.71)	Average
Laks, Hillel	Surgeon Overall	39	7	0	0.00	1.67	0.00	(0.00, 65.19)	Average
	Ronald Reagan UCLA Medical Center	39	7	0	0.00	1.67	0.00	(0.00, 65.19)	Average
Lam, Tuan	Surgeon Overall	219	187	6	3.21	1.83	3.63	(1.33, 7.87)	Average
	Beverly Hospital	13	13	0	0.00	1.70	0.00	(0.00, 34.34)	Average
	Citrus Valley Medical Center – IC Campus	49	42	3	7.14	2.26	6.52	(1.34, 19.00)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Lam, Tuan (continued)	Fountain Valley Regional Hospital and Medical Center – Euclid	29	25	0	0.00	1.97	0.00	(0.00, 15.42)	Average
	Garfield Medical Center	58	51	1	1.96	1.13	3.59	(0.09, 19.96)	Average
	Long Beach Memorial Medical Center	25	22	1	4.55	2.69	3.49	(0.09, 19.42)	Average
	Orange Coast Memorial Medical Center	45	34	1	2.94	1.72	3.53	(0.09, 19.60)	Average
Lapunzina, Paul M.	Surgeon Overall	126	96	1	1.04	1.26	1.70	(0.04, 9.45)	Average
	Kaiser Foundation Hospital – San Francisco	126	96	1	1.04	1.26	1.70	(0.04, 9.45)	Average
Lee, Anthony W.	Surgeon Overall	88	76	2	2.63	1.31	4.15	(0.50, 14.97)	Average
	Downey Regional Medical Center	10	9	1	11.11	0.59	39.06	(0.99, 100.0)	Average
	St. Francis Medical Center	78	67	1	1.49	1.41	2.19	(0.06, 12.19)	Average
Lee, Hon S.	Surgeon Overall	109	74	1	1.35	2.31	1.21	(0.03, 6.72)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Lee, Hon S. (continued)	Kaiser Foundation Hospital – Santa Clara	105	71	1	1.41	2.30	1.27	(0.03, 7.04)	Average
	Mercy General Hospital	4	3	0	0.00	2.55	0.00	(0.00, 99.23)	Average
Lee, Kenneth T.	Surgeon Overall	49	43	1	2.33	2.29	2.09	(0.05, 11.64)	Average
	O'Connor Hospital – San Jose	27	25	1	4.00	1.80	4.58	(0.12, 25.47)	Average
	Regional Medical of San Jose	22	18	0	0.00	2.97	0.00	(0.00, 14.20)	Average
Lee, Sang H.	Surgeon Overall	201	167	2	1.20	1.92	1.29	(0.16, 4.63)	Average
	O'Connor Hospital – San Jose	83	72	1	1.39	1.68	1.70	(0.04, 9.46)	Average
	Regional Medical of San Jose	118	95	1	1.05	2.10	1.03	(0.03, 5.74)	Average
Lemire, Guy G.	Surgeon Overall	9	8	0	0.00	3.15	0.00	(0.00, 30.14)	Average
	Enloe Medical Center – Esplanade Campus	9	8	0	0.00	3.15	0.00	(0.00, 30.14)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Lemoine, Philippe	Surgeon Overall	49	39	3	7.69	2.84	5.59	(1.15, 16.30)	Average
	Centinela Hospital Medical Center	14	11	1	9.09	3.58	5.24	(0.13, 29.12)	Average
	Providence Little Company of Mary Medical Center – Torrance	32	25	2	8.00	2.73	6.04	(0.73, 21.78)	Average
	St. Vincent Medical Center	3	3	0	0.00	1.03	0.00	(0.00, 100.0)	Average
Lin, Yuan H.	Surgeon Overall	140	121	3	2.48	3.67	1.40	(0.29, 4.07)	Average
	Alvarado Hospital Medical Center	15	13	0	0.00	2.84	0.00	(0.00, 20.56)	Average
	Grossmont Hospital	108	94	3	3.19	3.98	1.65	(0.34, 4.82)	Average
	Sharp Chula Vista Medical Center	17	14	0	0.00	2.29	0.00	(0.00, 23.72)	Average
Liu, Minghui	Surgeon Overall	89	79	1	1.27	2.33	1.12	(0.03, 6.24)	Average
	Doctors Medical Center	89	79	1	1.27	2.33	1.12	(0.03, 6.24)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Longoria, James	Surgeon Overall	264	176	5	2.84	2.11	2.78	(0.90, 6.46)	Average
	Sutter Memorial Hospital	264	176	5	2.84	2.11	2.78	(0.90, 6.46)	Average
MacMillan, James C.	Surgeon Overall	129	106	8	7.55	2.29	6.81	(2.93, 13.38)	Worse
	Doctors Medical Center	129	106	8	7.55	2.29	6.81	(2.93, 13.38)	Worse
Madani, Michael	Surgeon Overall	65	31	0	0.00	2.49	0.00	(0.00, 9.83)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	65	31	0	0.00	2.49	0.00	(0.00, 9.83)	Average
Magliato, Kathy	Surgeon Overall	3	2	0	0.00	0.81	0.00	(0.00, 100.0)	Average
	St. John's Health Center	3	2	0	0.00	0.81	0.00	(0.00, 100.0)	Average
Mahendra, Tom	Surgeon Overall	35	31	1	3.23	1.35	4.95	(0.13, 27.52)	Average
	Antelope Valley Hospital	19	18	0	0.00	1.51	0.00	(0.00, 27.95)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Mahendra, Tom (continued)	Palmdale Regional Medical Center	16	13	1	7.69	1.12	14.22	(0.36, 79.02)	Average
Malekmehr, Farshad	Surgeon Overall	65	60	1	1.67	1.24	2.78	(0.07, 15.43)	Average
	Northridge Hospital Medical Center	1	1	0	0.00	0.73	0.00	(0.00, 100.0)	Average
	Providence Holy Cross Medical Center	1	1	0	0.00	1.02	0.00	(0.00, 100.0)	Average
	Valley Presbyterian Hospital	62	57	1	1.75	1.26	2.87	(0.07, 15.94)	Average
	White Memorial Medical Center	1	1	0	0.00	0.64	0.00	(0.00, 100.0)	Average
Malki, Alan E.	Surgeon Overall	323	273	4	1.47	1.93	1.56	(0.43, 4.00)	Average
	Riverside Community Hospital	70	57	2	3.51	2.04	3.55	(0.43, 12.80)	Average
	St. Bernardine Medical Center	176	149	2	1.34	2.08	1.34	(0.16, 4.81)	Average
	St. Mary Regional Medical Center	77	67	0	0.00	1.53	0.00	(0.00, 7.41)	Average
Mallidi, Hari	Surgeon Overall	55	44	3	6.82	2.30	6.12	(1.26, 17.84)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Mallidi, Hari (continued)	Santa Clara Valley Medical Center	41	34	1	2.94	1.46	4.16	(0.11, 23.11)	Average
	Stanford Hospital	14	10	2	20.00	5.16	8.00	(0.97, 28.85)	Average
Marmureanu, Alexandru R.	Surgeon Overall	17	16	0	0.00	1.36	0.00	(0.00, 34.99)	Average
	Centinela Hospital Medical Center	1	1	0	0.00	1.50	0.00	(0.00, 100.0)	Average
	St. Vincent Medical Center	16	15	0	0.00	1.35	0.00	(0.00, 37.59)	Average
Mayer, Frederick W.	Surgeon Overall	130	108	0	0.00	1.77	0.00	(0.00, 3.97)	Average
	Community Regional Medical Center – Fresno	3	3	0	0.00	1.54	0.00	(0.00, 100.0)	Average
	Fresno Heart and Surgical Center	52	46	0	0.00	1.82	0.00	(0.00, 9.07)	Average
	Kaweah Delta Medical Center	75	59	0	0.00	1.75	0.00	(0.00, 7.38)	Average
Mazur, Paul A.	Surgeon Overall	92	77	2	2.60	1.99	2.69	(0.33, 9.71)	Average
	Lakewood Regional Medical Center	8	7	0	0.00	2.00	0.00	(0.00, 54.41)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Mazur, Paul A. (continued)	Long Beach Memorial Medical Center	30	22	0	0.00	2.31	0.00	(0.00, 14.94)	Average
	Orange Coast Memorial Medical Center	14	14	0	0.00	1.94	0.00	(0.00, 28.04)	Average
	Tri-City Medical Center	40	34	2	5.88	1.80	6.73	(0.81, 24.25)	Average
McClellan, Michael	Surgeon Overall	23	21	2	9.52	5.27	3.73	(0.45, 13.44)	Average
	Centinela Hospital Medical Center	1	1	0	0.00	0.67	0.00	(0.00, 100.0)	Average
	Hollywood Presbyterian Medical Center	1	1	0	0.00	0.63	0.00	(0.00, 100.0)	Average
	Providence St. Joseph Medical Center	3	2	0	0.00	0.94	0.00	(0.00, 100.0)	Average
	St. Vincent Medical Center	18	17	2	11.76	6.32	3.84	(0.46, 13.84)	Average
McConnell, Douglas H.	Surgeon Overall	131	116	3	2.59	2.05	2.60	(0.54, 7.58)	Average
	Shasta Regional Medical Center	131	116	3	2.59	2.05	2.60	(0.54, 7.58)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
McDonald, Jerome M.	Surgeon Overall	248	185	10	5.41	4.12	2.71	(1.30, 4.97)	Average
	Dameron Hospital	50	46	4	8.70	4.04	4.44	(1.21, 11.34)	Average
	St. Joseph's Medical Center of Stockton	198	139	6	4.32	4.14	2.15	(0.79, 4.68)	Average
McPherson, James	Surgeon Overall	78	61	3	4.92	2.02	5.02	(1.03, 14.64)	Average
	Centinela Hospital Medical Center	3	3	1	33.33	7.16	9.61	(0.24, 53.44)	Average
	Glendale Adventist Medical Center – Wilson Terrace	5	4	0	0.00	1.45	0.00	(0.00, 100.0)	Average
	Providence Little Company of Mary Medical Center – Torrance	46	32	1	3.13	2.23	2.89	(0.07, 16.07)	Average
	Shasta Regional Medical Center	2	2	0	0.00	1.41	0.00	(0.00, 100.0)	Average
	St. Vincent Medical Center	21	19	1	5.26	1.11	9.83	(0.25, 54.66)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
McPherson, James (continued)	Torrance Memorial Medical Center	1	1	0	0.00	0.90	0.00	(0.00, 100.0)	Average
Mehmood, Syed A.	Surgeon Overall	24	21	1	4.76	3.69	2.66	(0.07, 14.80)	Average
	Northridge Hospital Medical Center	1	1	0	0.00	1.28	0.00	(0.00, 100.0)	Average
	Providence Holy Cross Medical Center	1	1	0	0.00	2.22	0.00	(0.00, 100.0)	Average
	Valley Presbyterian Hospital	22	19	1	5.26	3.90	2.79	(0.07, 15.50)	Average
Melikian, Vicken	Surgeon Overall	86	43	0	0.00	1.23	0.00	(0.00, 14.31)	Average
	Kaiser Foundation Hospital – San Francisco	86	43	0	0.00	1.23	0.00	(0.00, 14.31)	Average
Mellinger, Douglas N.	Surgeon Overall	73	64	0	0.00	1.95	0.00	(0.00, 6.09)	Average
	Scripps Memorial Hospital – La Jolla	73	64	0	0.00	1.95	0.00	(0.00, 6.09)	Average
Merrick, Scot H.	Surgeon Overall	79	55	1	1.82	2.68	1.40	(0.04, 7.77)	Average
	UCSF Medical Center	79	55	1	1.82	2.68	1.40	(0.04, 7.77)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Miller, David C.	Surgeon Overall	16	1	0	0.00	2.63	0.00	(0.00, 100.0)	Average
	Stanford Hospital	16	1	0	0.00	2.63	0.00	(0.00, 100.0)	Average
Milliken, Jeffrey C.	Surgeon Overall	80	64	1	1.56	3.29	0.98	(0.02, 5.45)	Average
	UC Irvine Medical Center	80	64	1	1.56	3.29	0.98	(0.02, 5.45)	Average
Mitchell, Robert S.	Surgeon Overall	57	33	0	0.00	1.22	0.00	(0.00, 18.93)	Average
	Stanford Hospital	57	33	0	0.00	1.22	0.00	(0.00, 18.93)	Average
Mitruka, Surindra N.	Surgeon Overall	148	118	3	2.54	1.92	2.73	(0.56, 7.96)	Average
	Dominican Hospital – Santa Cruz/Soquel	58	46	1	2.17	2.01	2.23	(0.06, 12.41)	Average
	Eisenhower Medical Center	90	72	2	2.78	1.87	3.07	(0.37, 11.08)	Average
Mittal, Arun K.	Surgeon Overall	1	1	0	0.00	0.64	0.00	(0.00, 100.0)	Average
	Torrance Memorial Medical Center	1	1	0	0.00	0.64	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Mohammadzadeh, Gholam	Surgeon Overall	132	107	5	4.67	2.12	4.54	(1.47, 10.58)	Average
	Los Robles Hospital and Medical Center	52	40	2	5.00	2.69	3.84	(0.46, 13.83)	Average
	Providence Tarzana Medical Center	43	33	2	6.06	1.64	7.63	(0.92, 27.49)	Average
	West Hills Hospital and Medical Center	37	34	1	2.94	1.92	3.16	(0.08, 17.55)	Average
Morales, Rodolfo	Surgeon Overall	89	62	2	3.23	1.77	3.76	(0.45, 13.54)	Average
	Good Samaritan Hospital – San Jose	86	59	2	3.39	1.78	3.94	(0.48, 14.19)	Average
	Regional Medical of San Jose	3	3	0	0.00	1.67	0.00	(0.00, 100.0)	Average
Morenocabral, Ricardo J.	Surgeon Overall	286	195	4	2.05	2.50	1.70	(0.46, 4.33)	Average
	Alvarado Hospital Medical Center	11	7	0	0.00	1.87	0.00	(0.00, 58.17)	Average
	Grossmont Hospital	78	46	0	0.00	2.74	0.00	(0.00, 6.03)	Average
	Scripps Mercy Hospital	24	21	0	0.00	1.87	0.00	(0.00, 19.32)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Morenocabral, Ricardo J. (continued)	Sharp Chula Vista Medical Center	173	121	4	3.31	2.55	2.68	(0.73, 6.84)	Average
Morris, Allen S.	Surgeon Overall	241	123	1	0.81	1.82	0.92	(0.02, 5.14)	Average
	Mercy General Hospital	239	121	1	0.83	1.83	0.93	(0.02, 5.18)	Average
	Mercy San Juan Hospital	2	2	0	0.00	0.86	0.00	(0.00, 100.0)	Average
Morrissey, James D.	Surgeon Overall	220	173	5	2.89	3.06	1.95	(0.63, 4.54)	Average
	Dameron Hospital	21	20	1	5.00	2.88	3.59	(0.09, 19.94)	Average
	St. Joseph's Medical Center of Stockton	199	153	4	2.61	3.08	1.75	(0.48, 4.47)	Average
Mudge, Devin R.	Surgeon Overall	256	218	6	2.75	1.65	3.45	(1.26, 7.49)	Average
	Riverside Community Hospital	1	1	0	0.00	1.71	0.00	(0.00, 100.0)	Average
	St. Bernardine Medical Center	194	172	6	3.49	1.65	4.38	(1.60, 9.51)	Average
	St. Mary Regional Medical Center	61	45	0	0.00	1.66	0.00	(0.00, 10.18)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Naficy, Sepehre	Surgeon Overall	25	23	2	8.70	1.12	16.00	(1.93, 57.68)	Average
	North Bay Medical Center	25	23	2	8.70	1.12	16.00	(1.93, 57.68)	Average
Nagendran, Jayan	Surgeon Overall	2	1	0	0.00	3.48	0.00	(0.00, 100.0)	Average
	Salinas Valley Memorial Hospital	2	1	0	0.00	3.48	0.00	(0.00, 100.0)	Average
Nasseri, Andrew F.	Surgeon Overall	3	3	0	0.00	1.16	0.00	(0.00, 100.0)	Average
	Emanuel Medical Center	3	3	0	0.00	1.16	0.00	(0.00, 100.0)	Average
Neal, Joe F.	Surgeon Overall	21	14	1	7.14	3.31	4.45	(0.11, 24.73)	Average
	Doctors Medical Center	21	14	1	7.14	3.31	4.45	(0.11, 24.73)	Average
Nucho, Ramsay C.	Surgeon Overall	126	109	2	1.83	1.41	2.69	(0.33, 9.70)	Average
	Glendale Adventist Medical Center – Wilson Terrace	36	33	0	0.00	1.31	0.00	(0.00, 17.61)	Average
	White Memorial Medical Center	90	76	2	2.63	1.45	3.75	(0.45, 13.50)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Nuno, Ismael N.	Surgeon Overall	8	7	0	0.00	0.43	0.00	(0.00, 100.0)	Average
	Los Angeles County/ University of Southern California Medical Center	8	7	0	0.00	0.43	0.00	(0.00, 100.0)	Average
O'doriso, James E.	Surgeon Overall	34	32	0	0.00	1.97	0.00	(0.00, 12.05)	Average
	Santa Rosa Memorial Hospital – Montgomery	8	6	0	0.00	2.91	0.00	(0.00, 43.54)	Average
	Sutter Medical Center of Santa Rosa	26	26	0	0.00	1.75	0.00	(0.00, 16.65)	Average
Odeh, Yousef M.	Surgeon Overall	3	3	0	0.00	5.74	0.00	(0.00, 44.15)	Average
	Eisenhower Medical Center	3	3	0	0.00	5.74	0.00	(0.00, 44.15)	Average
Ogden, William	Surgeon Overall	103	84	1	1.19	1.49	1.65	(0.04, 9.18)	Average
	Santa Clara Valley Medical Center	71	57	1	1.75	1.12	3.23	(0.08, 17.96)	Average
	St. Agnes Medical Center	32	27	0	0.00	2.26	0.00	(0.00, 12.44)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Oka, Tomomi	Surgeon Overall	96	72	1	1.39	1.54	1.87	(0.05, 10.37)	Average
	Dominican Hospital – Santa Cruz/Soquel	1	0	.	.	.	.		Not Applicable
	El Camino Hospital	37	30	1	3.33	1.54	4.48	(0.11, 24.91)	Average
	Peninsula Medical Center	56	41	0	0.00	1.54	0.00	(0.00, 12.00)	Average
	Sequoia Hospital	2	1	0	0.00	1.28	0.00	(0.00, 100.0)	Average
Omari, Bassam O.	Surgeon Overall	109	94	1	1.06	1.78	1.23	(0.03, 6.85)	Average
	Los Angeles County/ Harbor – UCLA Medical Center	103	88	1	1.14	1.33	1.76	(0.04, 9.79)	Average
	St. Mary Medical Center	3	3	0	0.00	13.61	0.00	(0.00, 18.61)	Average
	St. Mary Regional Medical Center	3	3	0	0.00	3.14	0.00	(0.00, 80.61)	Average
Osman, Ashraf I.	Surgeon Overall	128	115	8	6.96	2.24	6.42	(2.77, 12.63)	Worse
	Fresno Heart and Surgical Center	5	4	0	0.00	0.64	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Osman, Ashraf I. (continued)	St. Agnes Medical Center	123	111	8	7.21	2.29	6.49	(2.79, 12.75)	Worse
Ott, Richard A.	Surgeon Overall	454	343	9	2.62	1.99	2.72	(1.24, 5.14)	Average
	AHMC Anaheim Regional Medical Center	251	188	7	3.72	1.81	4.24	(1.70, 8.72)	Average
	Saddleback Memorial Medical Center	4	2	0	0.00	1.28	0.00	(0.00, 100.0)	Average
	Western Medical Center – Santa Ana	114	92	1	1.09	2.04	1.10	(0.03, 6.11)	Average
	Western Medical Center Hospital – Anaheim	85	61	1	1.64	2.51	1.35	(0.03, 7.50)	Average
Overton, John B.	Surgeon Overall	21	20	2	10.00	2.52	8.20	(0.99, 29.56)	Average
	Dameron Hospital	21	20	2	10.00	2.52	8.20	(0.99, 29.56)	Average
Oyer, Philip E.	Surgeon Overall	6	5	0	0.00	1.58	0.00	(0.00, 96.46)	Average
	Stanford Hospital	6	5	0	0.00	1.58	0.00	(0.00, 96.46)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Palafox, Brian A.	Surgeon Overall	166	110	0	0.00	1.91	0.00	(0.00, 3.62)	Average
	St. Joseph Hospital – Orange	166	110	0	0.00	1.91	0.00	(0.00, 3.62)	Average
Panagiotides, George	Surgeon Overall	244	226	9	3.98	2.63	3.12	(1.43, 5.92)	Average
	Downey Regional Medical Center	37	35	2	5.71	2.26	5.23	(0.63, 18.84)	Average
	Lakewood Regional Medical Center	107	97	4	4.12	3.22	2.65	(0.72, 6.76)	Average
	Long Beach Memorial Medical Center	89	83	2	2.41	2.23	2.23	(0.27, 8.03)	Average
	Shasta Regional Medical Center	4	4	0	0.00	1.26	0.00	(0.00, 100.0)	Average
	St. Mary Medical Center	7	7	1	14.29	1.89	15.64	(0.39, 86.91)	Average
Paw, Patrick T.	Surgeon Overall	166	153	3	1.96	2.16	1.88	(0.39, 5.48)	Average
	Bakersfield Heart Hospital	22	19	0	0.00	2.08	0.00	(0.00, 19.19)	Average
	Bakersfield Memorial Hospital	76	68	2	2.94	2.06	2.95	(0.36, 10.63)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Paw, Patrick T. (continued)	San Joaquin Community Hospital	68	66	1	1.52	2.28	1.37	(0.03, 7.64)	Average
Peck, Eric A.	Surgeon Overall	163	138	4	2.90	2.07	2.90	(0.79, 7.40)	Average
	Bakersfield Heart Hospital	38	35	1	2.86	2.20	2.68	(0.07, 14.89)	Average
	Bakersfield Memorial Hospital	80	67	2	2.99	1.72	3.58	(0.43, 12.91)	Average
	San Joaquin Community Hospital	45	36	1	2.78	2.58	2.22	(0.06, 12.35)	Average
Pellegrini, Daniel P.	Surgeon Overall	121	86	1	1.16	1.41	1.70	(0.04, 9.47)	Average
	Kaiser Foundation Hospital – San Francisco	121	86	1	1.16	1.41	1.70	(0.04, 9.47)	Average
Perch, Paul G.	Surgeon Overall	270	266	1	0.38	1.47	0.53	(0.01, 2.93)	Average
	Kaiser Foundation Hospital - Sunset	209	206	1	0.49	1.58	0.63	(0.02, 3.52)	Average
	St. Bernardine Medical Center	61	60	0	0.00	1.10	0.00	(0.00, 11.54)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Perkowski, David J.	Surgeon Overall	161	141	7	4.96	2.26	4.54	(1.82, 9.32)	Average
	Mission Hospital Regional Medical Center	15	15	2	13.33	5.18	5.32	(0.64, 19.16)	Average
	Saddleback Memorial Medical Center	141	121	4	3.31	1.94	3.52	(0.96, 9.00)	Average
	St. Joseph Hospital – Orange	2	2	0	0.00	1.79	0.00	(0.00, 100.0)	Average
	Tri-City Medical Center	3	3	1	33.33	0.99	69.63	(1.76, 100.0)	Average
Perricone, Anthony	Surgeon Overall	38	37	0	0.00	0.92	0.00	(0.00, 22.28)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	36	35	0	0.00	0.90	0.00	(0.00, 24.25)	Average
	UC San Diego Health – Hillcrest Medical Center	2	2	0	0.00	1.38	0.00	(0.00, 100.0)	Average
Petrik, Pavel V.	Surgeon Overall	38	36	2	5.56	2.07	5.54	(0.67, 19.98)	Average
	Antelope Valley Hospital	31	30	2	6.67	2.03	6.78	(0.82, 24.43)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Petrik, Pavel V. (continued)	Palmdale Regional Medical Center	7	6	0	0.00	2.26	0.00	(0.00, 55.94)	Average
Pfeffer, Thomas A.	Surgeon Overall	220	123	1	0.81	2.06	0.81	(0.02, 4.52)	Average
	Kaiser Foundation Hospital – Sunset	191	107	1	0.93	2.15	0.90	(0.02, 4.98)	Average
	St. Bernardine Medical Center	29	16	0	0.00	1.48	0.00	(0.00, 32.18)	Average
Poa, Li	Surgeon Overall	58	45	0	0.00	1.49	0.00	(0.00, 11.36)	Average
	Kaiser Foundation Hospital – Sunset	15	13	0	0.00	1.03	0.00	(0.00, 56.48)	Average
	Providence Little Company of Mary Medical Center – Torrance	43	32	0	0.00	1.67	0.00	(0.00, 14.22)	Average
Pompili, Mario F.	Surgeon Overall	157	85	1	1.18	1.98	1.23	(0.03, 6.83)	Average
	Kaiser Foundation Hospital – Santa Clara	157	85	1	1.18	1.98	1.23	(0.03, 6.83)	Average
Postel, Joachim M.	Surgeon Overall	60	51	1	1.96	5.53	0.73	(0.02, 4.07)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Postel, Joachim M. (continued)	St. Joseph Hospital – Eureka	60	51	1	1.96	5.53	0.73	(0.02, 4.07)	Average
Pottmeyer, Edward W.	Surgeon Overall	271	197	4	2.03	2.82	1.49	(0.40, 3.80)	Average
	Mercy Medical Center – Redding	271	197	4	2.03	2.82	1.49	(0.40, 3.80)	Average
Pretorius, Gert Diederick	Surgeon Overall	67	43	0	0.00	1.66	0.00	(0.00, 10.65)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	67	43	0	0.00	1.66	0.00	(0.00, 10.65)	Average
Puig-Palomar, Miguel	Surgeon Overall	318	269	4	1.49	2.17	1.42	(0.39, 3.62)	Average
	Enloe Medical Center – Esplanade Campus	318	269	4	1.49	2.17	1.42	(0.39, 3.62)	Average
Purewal, Sarabjit S.	Surgeon Overall	333	266	7	2.63	2.27	2.39	(0.96, 4.91)	Average
	Bakersfield Heart Hospital	151	120	5	4.17	2.35	3.66	(1.19, 8.52)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Purewal, Sarabjit S. (continued)	Bakersfield Memorial Hospital	145	113	2	1.77	2.13	1.71	(0.21, 6.18)	Average
	San Joaquin Community Hospital	37	33	0	0.00	2.47	0.00	(0.00, 9.32)	Average
Rabkin, David G.	Surgeon Overall	13	12	0	0.00	1.81	0.00	(0.00, 34.97)	Average
	Alta Bates Summit Medical Center – Summit Campus	13	12	0	0.00	1.81	0.00	(0.00, 34.97)	Average
Raissi, Sharo	Surgeon Overall	50	30	0	0.00	1.57	0.00	(0.00, 16.14)	Average
	Torrance Memorial Medical Center	50	30	0	0.00	1.57	0.00	(0.00, 16.14)	Average
Ramzy, Danny	Surgeon Overall	46	33	1	3.03	1.46	4.28	(0.11, 23.79)	Average
	Cedars Sinai Medical Center	46	33	1	3.03	1.46	4.28	(0.11, 23.79)	Average
Raney, Aidan A.	Surgeon Overall	78	23	1	4.35	3.54	2.54	(0.06, 14.10)	Average
	Hoag Memorial Hospital Presbyterian	78	23	1	4.35	3.54	2.54	(0.06, 14.10)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Rasi, Alfredo L.	Surgeon Overall	110	96	NA	NA	NA	NA	NA	NA
	Loma Linda Murrieta**	22	20	NA	NA	NA	NA	NA	NA
	Loma Linda University Medical Center	88	76	3	3.95	2.35	3.46	(0.71, 10.09)	Average
Razzouk, Anees J.	Surgeon Overall	90	56	0	0.00	1.52	0.00	(0.00, 8.91)	Average
	Loma Linda University Medical Center	90	56	0	0.00	1.52	0.00	(0.00, 8.91)	Average
Reemtsen, Brian L.	Surgeon Overall	1	0	.	.	.	.		Not Applicable
	Ronald Reagan UCLA Medical Center	1	0	.	.	.	.		Not Applicable
Reichman, Robert T.	Surgeon Overall	128	95	3	3.16	2.21	2.95	(0.61, 8.59)	Average
	Palomar Medical Center	128	95	3	3.16	2.21	2.95	(0.61, 8.59)	Average
Richter, Richard C.	Surgeon Overall	81	68	0	0.00	1.44	0.00	(0.00, 7.76)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Richter, Richard C. (continued)	Kaiser Foundation Hospital – San Francisco	81	68	0	0.00	1.44	0.00	(0.00, 7.76)	Average
Robbins, Robert C.	Surgeon Overall	9	5	0	0.00	1.66	0.00	(0.00, 91.68)	Average
	Stanford Hospital	9	5	0	0.00	1.66	0.00	(0.00, 91.68)	Average
Roberts, Randall F.	Surgeon Overall	161	141	2	1.42	1.48	1.98	(0.24, 7.12)	Average
	California Hospital Medical Center – Los Angeles	8	8	0	0.00	1.75	0.00	(0.00, 54.30)	Average
	Glendale Adventist Medical Center – Wilson Terrace	34	32	2	6.25	1.84	7.02	(0.85, 25.28)	Average
	Glendale Memorial Hospital and Health Center	119	101	0	0.00	1.35	0.00	(0.00, 5.58)	Average
Robertson, John	Surgeon Overall	74	51	1	1.96	2.30	1.76	(0.04, 9.79)	Average
	St. John's Health Center	74	51	1	1.96	2.30	1.76	(0.04, 9.79)	Average
Rosenburg, Jeffrey M.	Surgeon Overall	4	4	0	0.00	1.94	0.00	(0.00, 98.13)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Rosenburg, Jeffrey M. (continued)	Palomar Medical Center	4	4	0	0.00	1.94	0.00	(0.00, 98.13)	Average
Sakopoulos, Andreas	Surgeon Overall	74	60	2	3.33	6.43	1.07	(0.13, 3.86)	Average
	St. Helena Hospital	74	60	2	3.33	6.43	1.07	(0.13, 3.86)	Average
Salem, Fakhri M.	Surgeon Overall	151	139	4	2.88	1.87	3.18	(0.87, 8.13)	Average
	Grossmont Hospital	41	37	2	5.41	1.50	7.43	(0.90, 26.79)	Average
	Scripps Mercy Hospital	109	101	2	1.98	2.00	2.05	(0.25, 7.38)	Average
	Sharp Chula Vista Medical Center	1	1	0	0.00	2.14	0.00	(0.00, 100.0)	Average
Schwartz, Steven M.	Surgeon Overall	59	44	0	0.00	1.84	0.00	(0.00, 9.37)	Average
	Good Samaritan Hospital - San Jose	57	42	0	0.00	1.87	0.00	(0.00, 9.69)	Average
	O'Connor Hospital – San Jose	2	2	0	0.00	1.34	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Serna, Daniel L.	Surgeon Overall	310	272	1	0.37	1.31	0.58	(0.01, 3.23)	Average
	Kaiser Foundation Hospital – Sunset	4	3	0	0.00	0.88	0.00	(0.00, 100.0)	Average
	St. Bernardine Medical Center	306	269	1	0.37	1.31	0.58	(0.01, 3.25)	Average
Shah, Sachin	Surgeon Overall	2	1	0	0.00	1.57	0.00	(0.00, 100.0)	Average
	California Pacific Medical Center – Pacific Campus	2	1	0	0.00	1.57	0.00	(0.00, 100.0)	Average
Sharma, Kapil	Surgeon Overall	223	159	2	1.26	1.73	1.50	(0.18, 5.40)	Average
	Mercy General Hospital	214	153	2	1.31	1.69	1.59	(0.19, 5.75)	Average
	Mercy San Juan Hospital	9	6	0	0.00	2.73	0.00	(0.00, 46.36)	Average
Shayan, Hossein	Surgeon Overall	84	72	0	0.00	2.48	0.00	(0.00, 4.25)	Average
	Riverside Community Hospital	27	25	0	0.00	3.66	0.00	(0.00, 8.31)	Average
	San Antonio Community Hospital	57	47	0	0.00	1.86	0.00	(0.00, 8.71)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Shemin, Richard J.	Surgeon Overall	144	54	1	1.85	1.80	2.12	(0.05, 11.79)	Average
	Ronald Reagan UCLA Medical Center	144	54	1	1.85	1.80	2.12	(0.05, 11.79)	Average
Shuman, Robert L.	Surgeon Overall	29	27	1	3.70	2.35	3.25	(0.08, 18.09)	Average
	Long Beach Memorial Medical Center	28	26	1	3.85	2.42	3.28	(0.08, 18.23)	Average
	St. Mary Medical Center	1	1	0	0.00	0.47	0.00	(0.00, 100.0)	Average
Silva, Raymond	Surgeon Overall	42	40	0	0.00	2.03	0.00	(0.00, 9.35)	Average
	Good Samaritan Hospital - San Jose	20	18	0	0.00	2.61	0.00	(0.00, 16.19)	Average
	O'Connor Hospital – San Jose	2	2	0	0.00	0.56	0.00	(0.00, 100.0)	Average
	Regional Medical of San Jose	13	13	0	0.00	1.45	0.00	(0.00, 40.28)	Average
	Washington Hospital – Fremont	7	7	0	0.00	2.05	0.00	(0.00, 53.03)	Average
Slachman, Frank N.	Surgeon Overall	242	157	1	0.64	1.93	0.68	(0.02, 3.78)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Slachman, Frank N. (continued)	Mercy General Hospital	224	145	1	0.69	1.98	0.72	(0.02, 4.00)	Average
	Mercy San Juan Hospital	18	12	0	0.00	1.36	0.00	(0.00, 46.66)	Average
Soltero, Michael	Surgeon Overall	105	74	3	4.05	2.93	2.86	(0.59, 8.33)	Average
	Henry Mayo Newhall Memorial Hospital	1	0	.	.	.	.		Not Applicable
	Northridge Hospital Medical Center	32	18	1	5.56	2.10	5.47	(0.14, 30.41)	Average
	Providence Holy Cross Medical Center	59	47	2	4.26	3.33	2.64	(0.32, 9.52)	Average
	Providence Tarzana Medical Center	3	3	0	0.00	1.04	0.00	(0.00, 100.0)	Average
	Valley Presbyterian Hospital	8	6	0	0.00	3.27	0.00	(0.00, 38.76)	Average
	West Hills Hospital and Medical Center	2	0	.	.	.	.		Not Applicable
Spowart, Gregory S.	Surgeon Overall	147	122	3	2.46	2.06	2.46	(0.51, 7.17)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Spowart, Gregory S. (continued)	Community Hospital Monterey Peninsula	147	122	3	2.46	2.06	2.46	(0.51, 7.17)	Average
Stahl, Richard D.	Surgeon Overall	213	154	3	1.95	1.83	2.20	(0.45, 6.41)	Average
	Scripps Memorial Hospital – La Jolla	213	154	3	1.95	1.83	2.20	(0.45, 6.41)	Average
Stanten, Russell D.	Surgeon Overall	97	80	1	1.25	2.71	0.95	(0.02, 5.30)	Average
	Alta Bates Summit Medical Center – Summit Campus	97	80	1	1.25	2.71	0.95	(0.02, 5.30)	Average
Starnes, Vaughn A.	Surgeon Overall	168	34	1	2.94	1.08	5.61	(0.14, 31.16)	Average
	Keck Hospital of USC	168	34	1	2.94	1.08	5.61	(0.14, 31.16)	Average
Stein, Alexander G.	Surgeon Overall	92	75	1	1.33	2.46	1.12	(0.03, 6.23)	Average
	Lakewood Regional Medical Center	2	2	0	0.00	1.68	0.00	(0.00, 100.0)	Average
	Long Beach Memorial Medical Center	3	3	0	0.00	4.71	0.00	(0.00, 53.73)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Stein, Alexander G. (continued)	St. Mary Medical Center	87	70	1	1.43	2.38	1.24	(0.03, 6.88)	Average
Stewart, Robert D.	Surgeon Overall	138	112	2	1.79	2.16	1.71	(0.21, 6.15)	Average
	Community Regional Medical Center – Fresno	62	50	1	2.00	2.73	1.52	(0.04, 8.42)	Average
	Dominican Hospital – Santa Cruz/Soquel	48	38	1	2.63	1.72	3.17	(0.08, 17.60)	Average
	Fresno Heart and Surgical Center	14	10	0	0.00	1.92	0.00	(0.00, 39.54)	Average
	St. Agnes Medical Center	14	14	0	0.00	1.52	0.00	(0.00, 35.66)	Average
Stoneburner, John M.	Surgeon Overall	94	60	2	3.33	2.42	2.84	(0.34, 10.25)	Average
	Torrance Memorial Medical Center	94	60	2	3.33	2.42	2.84	(0.34, 10.25)	Average
Tabai, Harold A.	Surgeon Overall	27	23	1	4.35	3.09	2.91	(0.07, 16.17)	Average
	Emanuel Medical Center	27	23	1	4.35	3.09	2.91	(0.07, 16.17)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Talieh, Yahya J.	Surgeon Overall	103	90	5	5.56	2.10	5.46	(1.77, 12.71)	Average
	Doctors Medical Center	34	29	2	6.90	1.94	7.33	(0.89, 26.43)	Average
	Memorial Hospital Medical Center – Modesto	69	61	3	4.92	2.18	4.66	(0.96, 13.60)	Average
Tang, Eddie	Surgeon Overall	62	51	3	5.88	2.99	4.07	(0.84, 11.86)	Average
	Emanuel Medical Center	2	2	0	0.00	1.85	0.00	(0.00, 100.0)	Average
	St. Mary's Medical Center – San Francisco	60	49	3	6.12	3.03	4.17	(0.86, 12.16)	Average
Taylor, Benedict J.	Surgeon Overall	45	42	1	2.38	1.41	3.49	(0.09, 19.42)	Average
	Santa Barbara Cottage Hospital	45	42	1	2.38	1.41	3.49	(0.09, 19.42)	Average
Tedesco, Dominic J.	Surgeon Overall	82	69	5	7.25	2.02	7.40	(2.40, 17.22)	Worse
	Community Memorial Hospital of San Buenaventura	82	69	5	7.25	2.02	7.40	(2.40, 17.22)	Worse

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Tendulkar, Amod P.	Surgeon Overall	102	84	3	3.57	2.55	2.89	(0.60, 8.44)	Average
	Dameron Hospital	12	10	1	10.00	1.27	16.26	(0.41, 90.39)	Average
	St. Joseph's Medical Center of Stockton	90	74	2	2.70	2.72	2.05	(0.25, 7.39)	Average
Thibault, William N.	Surgeon Overall	131	122	0	0.00	2.09	0.00	(0.00, 2.98)	Average
	Mission Hospital Regional Medical Center	47	43	0	0.00	2.21	0.00	(0.00, 8.00)	Average
	Saddleback Memorial Medical Center	6	6	0	0.00	1.45	0.00	(0.00, 87.28)	Average
	St. Jude Medical Center	78	73	0	0.00	2.07	0.00	(0.00, 5.03)	Average
Toporoff, Bruce M.	Surgeon Overall	68	57	1	1.75	3.17	1.14	(0.03, 6.35)	Average
	Community Memorial Hospital of San Buenaventura	9	9	0	0.00	2.79	0.00	(0.00, 30.23)	Average
	Los Robles Hospital and Medical Center	2	1	0	0.00	0.43	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Toporoff, Bruce M. (continued)	St. John's Regional Medical Center	57	47	1	2.13	3.30	1.33	(0.03, 7.39)	Average
Tovar, Eduardo	Surgeon Overall	242	139	1	0.72	2.68	0.55	(0.01, 3.08)	Average
	Presbyterian Intercommunity Hospital	242	139	1	0.72	2.68	0.55	(0.01, 3.08)	Average
Trento, Alfredo	Surgeon Overall	120	56	0	0.00	1.30	0.00	(0.00, 10.45)	Average
	Cedars Sinai Medical Center	120	56	0	0.00	1.30	0.00	(0.00, 10.45)	Average
Trivedi, Rohitkumar R.	Surgeon Overall	67	57	1	1.75	2.43	1.49	(0.04, 8.29)	Average
	Desert Valley Hospital	2	2	0	0.00	2.69	0.00	(0.00, 100.0)	Average
	Pomona Valley Hospital Medical Center	46	38	1	2.63	2.81	1.94	(0.05, 10.76)	Average
	San Antonio Community Hospital	19	17	0	0.00	1.55	0.00	(0.00, 28.89)	Average
Tsau, Pei H.	Surgeon Overall	8	6	0	0.00	0.93	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Tsau, Pei H. (continued)	Dominican Hospital – Santa Cruz/Soquel	1	1	0	0.00	0.46	0.00	(0.00, 100.0)	Average
	El Camino Hospital	6	5	0	0.00	1.02	0.00	(0.00, 100.0)	Average
	Peninsula Medical Center	1	0	.	.	.	.		Not Applicable
Tyner, John	Surgeon Overall	141	70	0	0.00	1.54	0.00	(0.00, 7.06)	Average
	Scripps Green Hospital	137	67	0	0.00	1.54	0.00	(0.00, 7.37)	Average
	Scripps Memorial Hospital – La Jolla	2	2	0	0.00	1.61	0.00	(0.00, 100.0)	Average
	Scripps Mercy Hospital	2	1	0	0.00	1.29	0.00	(0.00, 100.0)	Average
Tzeng, Thomas S.	Surgeon Overall	22	19	0	0.00	1.10	0.00	(0.00, 36.42)	Average
	Downey Regional Medical Center	16	15	0	0.00	1.04	0.00	(0.00, 48.62)	Average
	Presbyterian Intercommunity Hospital	6	4	0	0.00	1.31	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Veeragandham, Ramesh	Surgeon Overall	152	114	0	0.00	1.71	0.00	(0.00, 3.89)	Average
	John Muir Medical Center – Concord Campus	117	88	0	0.00	1.72	0.00	(0.00, 5.02)	Average
	San Ramon Regional Medical Center	13	11	0	0.00	1.22	0.00	(0.00, 56.47)	Average
	ValleyCare Medical Center	22	15	0	0.00	2.04	0.00	(0.00, 24.84)	Average
Vial, Conrad M.	Surgeon Overall	126	84	2	2.38	1.27	3.88	(0.47, 13.97)	Average
	Dominican Hospital – Santa Cruz/Soquel	24	18	1	5.56	1.51	7.61	(0.19, 42.31)	Average
	El Camino Hospital	39	23	0	0.00	1.13	0.00	(0.00, 29.17)	Average
	Peninsula Medical Center	54	38	1	2.63	1.23	4.40	(0.11, 24.48)	Average
	Sequoia Hospital	9	5	0	0.00	1.29	0.00	(0.00, 100.0)	Average
Vo, Quang T.	Surgeon Overall	155	143	3	2.10	1.91	2.27	(0.47, 6.61)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Vo, Quang T. (continued)	Beverly Hospital	9	9	0	0.00	1.16	0.00	(0.00, 73.08)	Average
	Citrus Valley Medical Center – IC Campus	29	27	0	0.00	1.52	0.00	(0.00, 18.54)	Average
	Fountain Valley Regional Hospital and Medical Center – Euclid	71	66	3	4.55	2.38	3.95	(0.81, 11.51)	Average
	Garfield Medical Center	24	24	0	0.00	1.29	0.00	(0.00, 24.57)	Average
	Long Beach Memorial Medical Center	3	3	0	0.00	1.98	0.00	(0.00, 100.0)	Average
	Orange Coast Memorial Medical Center	14	9	0	0.00	1.75	0.00	(0.00, 48.37)	Average
	Saddleback Memorial Medical Center	2	2	0	0.00	1.14	0.00	(0.00, 100.0)	Average
	UC Irvine Medical Center	3	3	0	0.00	3.35	0.00	(0.00, 75.67)	Average
Vunnamadala, Syam P.	Surgeon Overall	117	106	5	4.72	2.52	3.87	(1.25, 9.00)	Average
	AHMC Anaheim Regional Medical Center	43	38	1	2.63	1.57	3.46	(0.09, 19.22)	Average
	West Anaheim Medical Center	43	39	2	5.13	2.77	3.83	(0.46, 13.79)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Vunnamadala, Syam P. (continued)	Western Medical Center Hospital – Anaheim	31	29	2	6.90	3.42	4.16	(0.50, 14.99)	Average
Walkes, Jon-Cecil	Surgeon Overall	147	135	5	3.70	2.56	2.99	(0.97, 6.95)	Average
	Washington Hospital – Fremont	147	135	5	3.70	2.56	2.99	(0.97, 6.95)	Average
Wang, Nan	Surgeon Overall	250	182	3	1.65	2.07	1.64	(0.34, 4.78)	Average
	Riverside Community Hospital	36	28	0	0.00	2.61	0.00	(0.00, 10.41)	Average
	San Antonio Community Hospital	214	154	3	1.95	1.98	2.03	(0.42, 5.93)	Average
West, Phillip N.	Surgeon Overall	149	109	1	0.92	1.68	1.13	(0.03, 6.27)	Average
	Santa Barbara Cottage Hospital	149	109	1	0.92	1.68	1.13	(0.03, 6.27)	Average
Westerman, George R.	Surgeon Overall	30	25	1	4.00	3.05	2.71	(0.07, 15.04)	Average
	Santa Barbara Cottage Hospital	30	25	1	4.00	3.05	2.71	(0.07, 15.04)	Average
Wieselthaler, Georg M.	Surgeon Overall	19	14	3	21.43	4.34	10.18	(2.10, 29.69)	Worse

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Wieselthaler, Georg M. (continued)	UCSF Medical Center	19	14	3	21.43	4.34	10.18	(2.10, 29.69)	Worse
Wilson, Joseph W.	Surgeon Overall	287	230	4	1.74	2.18	1.65	(0.45, 4.20)	Average
	Eisenhower Medical Center	287	230	4	1.74	2.18	1.65	(0.45, 4.20)	Average
Yagubyan, Marineh	Surgeon Overall	117	104	1	0.96	1.54	1.29	(0.03, 7.18)	Average
	Glendale Adventist Medical Center – Wilson Terrace	73	66	1	1.52	1.66	1.88	(0.05, 10.47)	Average
	Glendale Memorial Hospital and Health Center	44	38	0	0.00	1.32	0.00	(0.00, 15.16)	Average
Yap, Alexander G.	Surgeon Overall	96	91	3	3.30	2.64	2.58	(0.53, 7.52)	Average
	Seton Medical Center	93	88	3	3.41	2.70	2.61	(0.54, 7.60)	Average
	St. Mary's Medical Center – San Francisco	3	3	0	0.00	0.80	0.00	(0.00, 100.0)	Average
Yasuda, Roderick	Surgeon Overall	112	96	5	5.21	2.22	4.84	(1.57, 11.26)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Yasuda, Roderick (continued)	Henry Mayo Newhall Memorial Hospital	2	1	0	0.00	0.61	0.00	(0.00, 100.0)	Average
	Northridge Hospital Medical Center	45	42	3	7.14	2.62	5.63	(1.16, 16.40)	Average
	Providence Holy Cross Medical Center	44	36	1	2.78	1.86	3.08	(0.08, 17.11)	Average
	Providence Tarzana Medical Center	2	2	0	0.00	4.00	0.00	(0.00, 94.94)	Average
	Valley Presbyterian Hospital	16	13	1	7.69	2.02	7.85	(0.20, 43.66)	Average
	West Hills Hospital and Medical Center	3	2	0	0.00	0.66	0.00	(0.00, 100.0)	Average
Yokoyama, Taro	Surgeon Overall	201	157	3	1.91	2.04	1.93	(0.40, 5.63)	Average
	Centinela Hospital Medical Center	26	24	0	0.00	1.47	0.00	(0.00, 21.54)	Average
	Good Samaritan Hospital – Los Angeles	2	2	0	0.00	2.02	0.00	(0.00, 100.0)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Yokoyama, Taro (continued)	Hollywood Presbyterian Medical Center	47	33	1	3.03	3.59	1.74	(0.04, 9.69)	Average
	Providence St. Joseph Medical Center	41	26	0	0.00	1.34	0.00	(0.00, 21.79)	Average
	St. Vincent Medical Center	85	72	2	2.78	1.78	3.22	(0.39, 11.62)	Average
Young, Joseph N.	Surgeon Overall	61	25	1	4.00	1.64	5.04	(0.13, 28.01)	Average
	UC Davis Medical Center	61	25	1	4.00	1.64	5.04	(0.13, 28.01)	Average
Yun, Kwok L.	Surgeon Overall	167	53	0	0.00	1.22	0.00	(0.00, 11.72)	Average
	Kaiser Foundation Hospital – Sunset	167	53	0	0.00	1.22	0.00	(0.00, 11.72)	Average
Zhu, Henry L.	Surgeon Overall	338	253	0	0.00	1.68	0.00	(0.00, 1.79)	Better
	Mercy General Hospital	58	54	0	0.00	2.00	0.00	(0.00, 7.05)	Average
	Mercy San Juan Hospital	280	199	0	0.00	1.60	0.00	(0.00, 2.39)	Average

Table B-4: Surgeon Risk-Adjusted Operative Mortality Results, 2011-2012

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		31,485	24,119	498	2.06				
Zusman, Douglas R.	Surgeon Overall	104	78	3	3.85	4.07	1.95	(0.40, 5.69)	Average
	Hoag Memorial Hospital Presbyterian	104	78	3	3.85	4.07	1.95	(0.40, 5.69)	Average

Note: Not Applicable, Non-isolated CABG cases were not used to determine performance ratings in this report.

*A surgeon is classified as **“Better”** if the upper 95% CI of the RAMR falls below the average observed mortality rate (2.06%). A surgeon is classified as **“Worse”** if the lower 95% CI of the RAMR is higher than the average observed mortality rate. A surgeon’s performance is considered **“Average”** if the average mortality rate falls within the 95% CI of a surgeon’s RAMR.

**Overall and hospital results are not shown because data necessary to confirm deaths was not available.

† The number of isolated CABG cases by surgeon may not equal the total number of isolated CABG cases reported due to various reasons, including unresolved issues of surgeon case attribution and cases not appearing for surgeons who died.

Risk Model for Adjusting Hospital Post-Operative Stroke Rates, 2011-2012

Post-operative stroke is a fairly rare but serious complication that can occur after CABG surgery. To assess hospital performance on this outcome, CCORP combined 2011 and 2012 data to increase the number of cases and reliability of hospital results. Similar to the methodology used to assess the operative mortality rate, CCORP used a multivariable logistic regression model to estimate the relationship between each of the demographic and pre-operative risk factors and the probability of post-operative stroke. The risk model, based on the 2011-2012 data, is presented in Table C-1 with statistically significant risk factors identified in bolded text.

Table C-1: Logistic Regression Risk Model for Post-Operative Stroke, 2011-2012

Risk Factors		Coefficient	Standard Error	p-value	Odds Ratio
Intercept		-7.069	0.568	<.0001	
Age (Years)		0.029	0.006	<.0001	1.030
Gender	Male	Reference			
	Female	0.294	0.119	0.014	1.341
Race	White	Reference			
	Non-White	0.455	0.115	<.0001	1.576
Status of the Procedure	Elective	Reference			
	Urgent	0.196	0.140	0.163	1.216
	Emergent	0.254	0.311	0.415	1.289
Last Creatinine Level Pre-Op (mg/dl)		0.114	0.195	0.560	1.120
Hypertension		0.232	0.208	0.265	1.261
Peripheral Arterial Disease		0.014	0.153	0.928	1.014
Cerebrovascular Disease		0.768	0.185	<.0001	2.156
Cerebrovascular Accident (CVA) Timing	NO CVA	Reference			
	> 2 weeks	0.182	0.213	0.394	1.199
	≤ 2 weeks	1.083	0.512	0.034	2.953
Diabetes		0.068	0.118	0.565	1.070
Chronic Lung Disease (CLD)	None/Mild	Reference			
	Moderate	-0.044	0.255	0.862	0.957
	Severe	0.418	0.223	0.061	1.519
Atrial Fibrillation/Flutter		0.092	0.182	0.613	1.097
Third Degree Heart Block		0.168	0.594	0.777	1.183
Sustained VT/VF		0.056	0.298	0.852	1.057
Timing of Myocardial Infarction (MI)	No MI	Reference			
	21 or more days ago	-0.234	0.174	0.177	0.791
	8-21 days ago	-0.148	0.237	0.533	0.863
	1-7 days ago	-0.018	0.145	0.899	0.982
	Within 24 Hours	0.368	0.277	0.183	1.445
Cardiogenic Shock		0.283	0.399	0.478	1.328

Table C-1: Logistic Regression Risk Model for Post-Operative Stroke, 2011-2012

Risk Factors		Coefficient	Standard Error	p-value	Odds Ratio
Heart Failure		0.095	0.161	0.555	1.100
NYHA Classifications	IV vs. I,II,III	0.416	0.202	0.040	1.516
Ejection Fraction (%)		-0.009	0.004	0.031	0.991
Left Main Disease (≥ 50%)		0.123	0.115	0.285	1.131
Number of Diseased Vessels	None, One or Two	Reference			
	Three or More	0.226	0.145	0.118	1.254
Year	2011				
	2012	0.145	0.110	0.187	1.156

Bolded text indicates statistical significance.

Note: “Last Creatinine Level” and “Ejection Fraction” were modeled using piecewise linear transformations.

Discrimination of Risk Model for Post-Operative Stroke

For the 2011-2012 risk model, the C-statistic was 0.715. The CCORP 2011-2012 risk model compares favorably with the Society of Thoracic Surgeons’ recently published post-operative stroke model (C-statistic = 0.716 for isolated CABG surgery).²

Calibration of Risk Model for Post-Operative Stroke

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 this post-operative stroke risk model is 0.087, indicating adequate calibration.

A second calibration test sorts the data and compares observed stroke cases with predicted stroke cases in each of 10 risk groups. As presented in Table C-2, Risk Group 1 shows the patients in the lowest risk group. Among the 2,304 patients in this group, 9 patients had post-operative strokes, but the model predicted 9.9 cases. Assuming a Poisson distribution for a binary outcome, the predicted range of strokes for this group is 3.7 to 16.1. The observed number of 9 strokes falls within the range of predicted strokes. In fact, 8 of the 10 risk groups have neither statistically significantly fewer nor significantly more post-operative strokes than were predicted by the model. Overall, the risk model shows no systematic underestimation or overestimation of stroke cases at the extremes.

² Shahian DM, O’Brien SM, Filardo G, et al. The Society of Thoracic Surgeons 2008 cardiac surgery risk models: part 1—coronary artery bypass grafting surgery. *Ann Thorac Surg* 2011; 88:S2-22.

Table C-2: Calibration of Risk Model for Post-Operative Stroke, 2011-2012

Risk Group	Isolated CABG Cases	Observed Post-op Strokes	Predicted Post-op Stroke	Difference	95%CI of Predicted Post-op Stroke
1	2,304	9	9.9	0.9	(3.7, 16.1)
2	2,302	6	13.9	7.9	(6.6, 21.3)
3	2,303	17	17.0	0.0	(8.9, 25.1)
4	2,302	16	19.9	3.9	(11.2, 28.7)
5	2,302	25	23.4	-1.6	(13.9, 32.8)
6	2,303	23	27.3	4.3	(17.1, 37.6)
7	2,303	34	32.6	-1.4	(21.4, 43.8)
8	2,302	47	40.2	-6.8	(27.8, 52.7)
9	2,303	71	54.1	-16.9	(39.7, 68.5)
10	2,291	96	105.6	9.6	(85.5, 125.8)
Total	23,015	344	344.0	0	

Note: Risk Group 1 is at lowest risk and Risk Group 10 is at highest risk.

Process for Calculating Risk-Adjusted Post-Op Stroke Rate and Performance Ratings

The risk-adjusted post-operative stroke rate (RASR) is computed by dividing the provider's number of patient strokes by the provider's expected number of patient strokes (based on the risk model) to obtain the observed/expected (O/E) ratio. The O/E ratio is then multiplied by the statewide post-operative stroke rate (1.48% for 2011-2012) to obtain the provider's RASR.

The performance rating is based on a comparison of the 95% confidence interval (CI) of each provider's RASR to the statewide post-operative stroke rate. Thus, CCORP treated 2011-2012 data as a sample, and inferred the range in which each provider's true performance was likely to fall. As shown in Table C-3, if the upper 95% CI of a provider's risk-adjusted stroke rate is below the state average stroke rate, indicating the provider's RASR is significantly lower than the state average, the performance rating is "**Better.**" If the lower 95% CI of a provider's RASR is above the state average stroke rate, indicating the provider's risk-adjusted stroke rate is significantly higher than the state average, the performance rating is "**Worse.**" If the state average stroke rate is within the 95% CI of a provider's RASR, the performance rating is "**Average.**" See the following section for a detailed discussion of results.

Statistical Details of Hospital Risk-Adjusted Post-Operative Stroke Results, 2011-2012

Table C-3 presents the risk-adjusted post-operative stroke results for each hospital for 2011-2012. The table is sorted by geographic region and contains, for each hospital, the total number of CABG surgeries performed (isolated and non-isolated combined), number of isolated CABG surgeries (excluding salvage cases), number of observed isolated CABG post-operative stroke cases, observed

post-operative stroke rate, expected post-operative stroke rate predicted by the risk model, RASR and 95% CI of the RASR, and the associated hospital performance rating.

Among the 24,119 isolated CABG surgeries performed in 2011-2012, 358 patients had a post-operative stroke in-hospital, reflecting overall statewide rate of 1.48%. Among 358 patients with post-operative stroke, 52 (14.5%) died either in-hospital or after discharge but within 30 days of CABG surgery. The observed stroke rate among hospitals ranged from 0% to 7.89%. The expected stroke rates, which are generated by the model and measure patient severity of illness, were between 0.74% and 2.21%. The risk-adjusted stroke rates, ranged from 0% to 6.36%.

Based on the 95% confidence intervals for risk-adjusted stroke rates, 121 of 126 hospitals (96%) performed within the expected range compared to the state's average stroke rate, one hospital performed significantly "**Better**" than the state average, and four hospitals performed significantly "**Worse**" than the state average (Table C-3).

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
Sacramento Valley & Northern California Region	Enloe Medical Center – Esplanade Campus	332	281	2	0.71	1.40	0.76	(0.09, 2.72)	Average
	Mercy General Hospital	1,495	990	19	1.92	1.35	2.11	(1.26, 3.28)	Average
	Mercy Medical Center – Redding	282	206	2	0.97	1.35	1.07	(0.13, 3.84)	Average
	Mercy San Juan Hospital	342	242	2	0.83	1.18	1.04	(0.13, 3.73)	Average
	Rideout Memorial Hospital	239	186	7	3.76	1.18	4.73	(1.90, 9.71)	Worse
	Shasta Regional Medical Center	144	128	0	0.00	1.18	0.00	(0.00, 3.62)	Average
	St. Joseph Hospital – Eureka	60	51	0	0.00	1.22	0.00	(0.00, 8.80)	Average
	Sutter Memorial Hospital	891	638	2	0.31	1.31	0.36	(0.04, 1.28)	Better
	UC Davis Medical Center	283	202	3	1.49	1.30	1.70	(0.35, 4.95)	Average
San Francisco Bay Area & San Jose	Alta Bates Summit Medical Center – Summit Campus	315	242	3	1.24	1.83	1.01	(0.21, 2.93)	Average
	California Pacific Medical Center – Pacific Campus	157	103	0	0.00	1.28	0.00	(0.00, 4.16)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
San Francisco Bay Area & San Jose (continued)	Community Hospital Monterey Peninsula	171	130	2	1.54	1.38	1.65	(0.20, 5.94)	Average
	Dominican Hospital – Santa Cruz/Soquel	134	105	2	1.90	1.32	2.14	(0.26, 7.70)	Average
	El Camino Hospital	198	125	1	0.80	1.33	0.89	(0.02, 4.96)	Average
	Good Samaritan Hospital - San Jose	187	138	3	2.17	1.68	1.92	(0.39, 5.59)	Average
	John Muir Medical Center – Concord Campus	537	425	4	0.94	1.35	1.04	(0.28, 2.65)	Average
	Kaiser Foundation Hospital – San Francisco	848	631	14	2.22	1.23	2.68	(1.46, 4.48)	Average
	Kaiser Foundation Hospital – Santa Clara	586	383	2	0.52	1.44	0.54	(0.06, 1.94)	Average
	Marin General Hospital	101	84	0	0.00	1.24	0.00	(0.00, 5.24)	Average
	North Bay Medical Center	94	88	3	3.41	1.50	3.38	(0.69, 9.85)	Average
	O'Connor Hospital – San Jose	127	112	2	1.79	1.50	1.77	(0.21, 6.38)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
San Francisco Bay Area & San Jose (continued)	Peninsula Medical Center	115	81	1	1.23	1.10	1.67	(0.04, 9.29)	Average
	Queen of the Valley Hospital – Napa	135	108	4	3.70	1.65	3.32	(0.90, 8.48)	Average
	Regional Medical of San Jose	156	129	0	0.00	2.21	0.00	(0.00, 1.92)	Average
	Salinas Valley Memorial Hospital	203	170	5	2.94	1.53	2.86	(0.93, 6.66)	Average
	San Ramon Regional Medical Center	73	64	0	0.00	1.14	0.00	(0.00, 7.46)	Average
	Santa Clara Valley Medical Center	184	159	2	1.26	1.36	1.37	(0.17, 4.94)	Average
	Santa Rosa Memorial Hospital – Montgomery	175	148	0	0.00	1.20	0.00	(0.00, 3.07)	Average
	Sequoia Hospital	204	109	0	0.00	1.40	0.00	(0.00, 3.57)	Average
	Seton Medical Center	127	114	9	7.89	1.84	6.36	(2.90, 12.04)	Worse
	St. Helena Hospital	121	101	1	0.99	1.80	0.82	(0.02, 4.53)	Average
St. Mary's Medical Center – San Francisco	65	54	3	5.56	1.78	4.63	(0.95, 13.48)	Average	

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
San Francisco Bay Area & San Jose (continued)	Stanford Hospital	225	133	2	1.50	1.26	1.78	(0.21, 6.40)	Average
	Sutter Medical Center of Santa Rosa	185	131	1	0.76	0.94	1.21	(0.03, 6.72)	Average
	UCSF Medical Center†	163	126	3	2.38	1.38	2.56	(0.53, 7.45)	Average
	ValleyCare Medical Center	92	72	0	0.00	1.41	0.00	(0.00, 5.36)	Average
	Washington Hospital – Fremont	178	166	2	1.20	1.88	0.95	(0.12, 3.43)	Average
Central California	Bakersfield Heart Hospital	211	174	7	4.02	1.50	3.98	(1.60, 8.18)	Worse
	Bakersfield Memorial Hospital	301	248	1	0.40	1.36	0.44	(0.01, 2.45)	Average
	Community Regional Medical Center – Fresno	564	477	5	1.05	1.57	0.99	(0.32, 2.30)	Average
	Dameron Hospital	113	105	5	4.76	1.91	3.70	(1.20, 8.60)	Average
	Doctors Medical Center	579	464	5	1.08	1.70	0.94	(0.31, 2.19)	Average
	Emanuel Medical Center	37	31	0	0.00	1.28	0.00	(0.00, 13.76)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
Central California (continued)	Fresno Heart and Surgical Center	434	359	4	1.11	1.26	1.31	(0.36, 3.35)	Average
	Kaweah Delta Medical Center	389	342	8	2.34	1.54	2.25	(0.97, 4.42)	Average
	Marian Medical Center	148	122	2	1.64	1.45	1.68	(0.20, 6.05)	Average
	Memorial Hospital Medical Center – Modesto	408	319	6	1.88	1.48	1.89	(0.69, 4.11)	Average
	San Joaquin Community Hospital	150	135	0	0.00	1.62	0.00	(0.00, 2.49)	Average
	St. Agnes Medical Center	608	529	5	0.95	1.55	0.90	(0.29, 2.10)	Average
	St. Joseph's Medical Center of Stockton	555	427	6	1.41	1.80	1.16	(0.42, 2.51)	Average
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara	Antelope Valley Hospital	50	48	2	4.17	1.47	4.20	(0.51, 15.11)	Average
	Community Memorial Hospital of San Buenaventura	166	143	2	1.40	1.45	1.43	(0.17, 5.14)	Average
	French Hospital Medical Center	204	141	4	2.84	1.57	2.69	(0.73, 6.86)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara (continued)	Glendale Adventist Medical Center – Wilson Terrace	261	225	1	0.44	1.20	0.55	(0.01, 3.06)	Average
	Glendale Memorial Hospital and Health Center	252	222	2	0.90	1.33	1.01	(0.12, 3.62)	Average
	Los Robles Hospital and Medical Center	151	102	3	2.94	1.40	3.12	(0.64, 9.10)	Average
	Northridge Hospital Medical Center	155	130	6	4.62	1.52	4.51	(1.65, 9.80)	Worse
	Palmdale Regional Medical Center	23	19	0	0.00	1.25	0.00	(0.00, 22.90)	Average
	Providence Holy Cross Medical Center	139	114	1	0.88	1.51	0.86	(0.02, 4.80)	Average
	Providence St. Joseph Medical Center	130	95	0	0.00	1.10	0.00	(0.00, 5.22)	Average
	Providence Tarzana Medical Center	118	93	3	3.23	1.50	3.18	(0.65, 9.27)	Average
	Santa Barbara Cottage Hospital	224	176	3	1.70	1.53	1.66	(0.34, 4.83)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara (continued)	St. John's Regional Medical Center	167	130	3	2.31	1.89	1.81	(0.37, 5.28)	Average
	Valley Presbyterian Hospital	119	102	2	1.96	1.38	2.10	(0.25, 7.58)	Average
	West Hills Hospital and Medical Center	116	97	1	1.03	1.20	1.28	(0.03, 7.10)	Average
Greater Los Angeles	Beverly Hospital	46	40	1	2.50	2.06	1.80	(0.05, 9.99)	Average
	California Hospital Medical Center – Los Angeles	8	8	0	0.00	1.85	0.00	(0.00, 36.86)	Average
	Cedars Sinai Medical Center	367	223	2	0.90	1.12	1.18	(0.14, 4.26)	Average
	Centinela Hospital Medical Center	45	40	2	5.00	1.95	3.80	(0.46, 13.70)	Average
	Citrus Valley Medical Center – IC Campus	258	215	5	2.33	1.63	2.11	(0.68, 4.92)	Average
	Downey Regional Medical Center	77	73	0	0.00	1.58	0.00	(0.00, 4.74)	Average
	Garfield Medical Center	286	252	6	2.38	1.94	1.82	(0.67, 3.96)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
Greater Los Angeles (continued)	Good Samaritan Hospital – Los Angeles	221	179	2	1.12	1.92	0.86	(0.10, 3.11)	Average
	Henry Mayo Newhall Memorial Hospital	4	2	0	0.00	0.74	0.00	(0.00, 100.0)	Average
	Hollywood Presbyterian Medical Center	48	34	0	0.00	1.47	0.00	(0.00, 10.89)	Average
	Huntington Memorial Hospital	196	143	1	0.70	1.27	0.82	(0.02, 4.54)	Average
	Kaiser Foundation Hospital – Sunset	1,331	1,010	13	1.29	1.51	1.26	(0.67, 2.15)	Average
	Keck Hospital of USC	381	109	2	1.83	1.35	2.01	(0.24, 7.26)	Average
	Los Angeles County/ University of Southern California Medical Center	282	229	2	0.87	1.11	1.17	(0.14, 4.20)	Average
	Los Angeles County/ Harbor - UCLA Medical Center	177	145	3	2.07	1.56	1.97	(0.41, 5.75)	Average
	Lakewood Regional Medical Center	214	184	3	1.63	1.93	1.25	(0.26, 3.65)	Average
	Long Beach Memorial Medical Center	371	313	3	0.96	1.62	0.88	(0.18, 2.56)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
Greater Los Angeles (continued)	Methodist Hospital of Southern California	107	86	1	1.16	1.81	0.95	(0.02, 5.30)	Average
	Presbyterian Intercommunity Hospital	248	143	1	0.70	2.04	0.51	(0.01, 2.83)	Average
	Providence Little Company of Mary Medical Center – Torrance	152	114	2	1.75	1.99	1.31	(0.16, 4.71)	Average
	Ronald Reagan UCLA Medical Center	431	194	6	3.09	1.44	3.18	(1.16, 6.90)	Average
	Santa Monica – UCLA Medical Center and Orthopaedic Hospital	1	1	0	0.00	1.19	0.00	(0.00, 100.0)	Average
	St. Francis Medical Center	78	67	0	0.00	1.37	0.00	(0.00, 5.94)	Average
	St. John's Health Center	111	78	0	0.00	1.26	0.00	(0.00, 5.55)	Average
	St. Mary Medical Center	104	86	0	0.00	1.84	0.00	(0.00, 3.45)	Average
	St. Vincent Medical Center	158	138	2	1.45	1.61	1.34	(0.16, 4.82)	Average
	Torrance Memorial Medical Center	158	101	4	3.96	1.64	3.58	(0.97, 9.14)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
Greater Los Angeles (continued)	White Memorial Medical Center	116	101	4	3.96	1.77	3.33	(0.90, 8.50)	Average
Inland Empire, Riverside & San Bernardino	Desert Regional Medical Center	276	227	2	0.88	1.46	0.90	(0.11, 3.23)	Average
	Desert Valley Hospital	5	5	0	0.00	1.98	0.00	(0.00, 55.18)	Average
	Eisenhower Medical Center	380	305	3	0.98	1.45	1.01	(0.21, 2.93)	Average
	Loma Linda Murrieta	47	44	0	0.00	1.42	0.00	(0.00, 8.75)	Average
	Loma Linda University Medical Center	477	384	8	2.08	1.46	2.12	(0.91, 4.17)	Average
	Pomona Valley Hospital Medical Center	259	226	3	1.33	2.04	0.97	(0.20, 2.82)	Average
	Riverside Community Hospital	437	357	3	0.84	1.43	0.87	(0.18, 2.54)	Average
	San Antonio Community Hospital	345	266	1	0.38	1.45	0.39	(0.01, 2.14)	Average
	St. Bernardine Medical Center	1,150	994	13	1.31	1.42	1.37	(0.73, 2.34)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
Inland Empire, Riverside & San Bernardino (continued)	St. Mary Regional Medical Center	257	212	2	0.94	1.35	1.04	(0.13, 3.74)	Average
Orange County	AHMC Anaheim Regional Medical Center	303	235	4	1.70	1.52	1.66	(0.45, 4.23)	Average
	Fountain Valley Regional Hospital and Medical Center – Euclid	237	212	6	2.83	2.12	1.98	(0.73, 4.30)	Average
	Hoag Memorial Hospital Presbyterian	395	242	2	0.83	1.42	0.86	(0.10, 3.10)	Average
	Mission Hospital Regional Medical Center	291	237	1	0.42	1.14	0.55	(0.01, 3.04)	Average
	Orange Coast Memorial Medical Center	123	99	3	3.03	1.36	3.31	(0.68, 9.65)	Average
	Saddleback Memorial Medical Center	187	160	3	1.88	1.17	2.39	(0.49, 6.96)	Average
	St. Joseph Hospital – Orange	250	174	1	0.57	1.35	0.63	(0.02, 3.51)	Average
	St. Jude Medical Center	205	172	3	1.74	1.34	1.93	(0.40, 5.62)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
Orange County (continued)	UC Irvine Medical Center	128	108	1	0.93	1.73	0.80	(0.02, 4.42)	Average
	West Anaheim Medical Center	46	41	0	0.00	1.78	0.00	(0.00, 7.46)	Average
	Western Medical Center – Santa Ana	119	96	1	1.04	1.63	0.95	(0.02, 5.26)	Average
	Western Medical Center Hospital – Anaheim	151	120	1	0.83	1.74	0.71	(0.02, 3.94)	Average
Greater San Diego	Alvarado Hospital Medical Center†	106	80	3	3.75	1.88	2.97	(0.61, 8.65)	Average
	Grossmont Hospital	360	281	7	2.49	1.80	2.05	(0.82, 4.22)	Average
	Palomar Medical Center	133	100	2	2.00	1.39	2.14	(0.26, 7.70)	Average
	Scripps Green Hospital	152	76	1	1.32	1.06	1.84	(0.05, 10.20)	Average
	Scripps Memorial Hospital – La Jolla	625	448	6	1.34	1.38	1.44	(0.53, 3.13)	Average
	Scripps Mercy Hospital	334	271	6	2.21	1.48	2.23	(0.81, 4.83)	Average
	Sharp Chula Vista Medical Center	305	236	9	3.81	2.06	2.75	(1.25, 5.20)	Average

Table C-3: Hospital Risk-Adjusted Post-Operative Stroke Results by Region, 2011-2012

Region	Hospital	All CABG Cases	Isolated CABG Cases	Isolated CABG Post-operative Strokes	Observed Post-operative Stroke Rate (%)	Expected Post-operative Stroke Rate (%)	Risk-Adjusted Post-operative Stroke Rate (% , RASR)	95%CI for RASR	Performance Rating
State		31,485	24,119	358	1.48				
Greater San Diego (continued)	Sharp Memorial Hospital	288	160	3	1.88	1.44	1.93	(0.40, 5.62)	Average
	Tri-City Medical Center	179	146	2	1.37	1.49	1.37	(0.17, 4.92)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	255	165	0	0.00	1.39	0.00	(0.00, 2.38)	Average
	UC San Diego Health – Hillcrest Medical Center	8	8	0	0.00	1.14	0.00	(0.00, 59.76)	Average

*A hospital is classified as **“Better”** if the upper 95% CI of the RASR falls below the California observed stroke rate (1.48%). A hospital is classified as **“Worse”** if the lower 95% CI of the RASR is higher than the California observed stroke rate. A hospital’s performance is considered **“Average”** if the California stroke rate falls within the 95% CI of a hospital’s RASR.

† Hospitals submitted statements regarding this report. See Appendix C for their statements.

Risk Model for Adjusting 30-Day Hospital Readmission Rates, 2012

Readmissions account for a significant percentage of hospital healthcare costs. With better care and discharge planning hospitals might avoid unnecessary readmissions. To assess hospital performance on this outcome, CCORP limited the analysis to isolated CABG surgery patients readmitted to any acute care hospital within 30 days of being discharged to home or a non-acute care setting. A readmission was counted only if the patient was readmitted with a principal diagnosis (i.e., principal reason for the readmission) that indicated a heart-related condition, or an infection or a complication that was likely related to the CABG surgery (see Appendix B for a list of principal diagnosis categories and their associated ICD-9-CM codes that were included in the readmissions analysis).

Similar to the methodology used to assess the operative mortality and post-operative stroke rate, CCORP used a multivariable logistic regression model to estimate the relationship between each of the demographic and pre-operative risk factors and the probability of 30-day readmission. The risk model, based on the 2012 data, is presented in Table D-1 with statistically significant risk factors identified in bolded text.

Table D-1: Logistic Regression Risk Model for 30-Day Readmission, 2012

Risk Factor		Coefficient	Standard Error	P-value	Odds Ratio
Intercept		-3.735	0.370	<.0001	
Patient Age (Years)		0.007	0.003	0.056	1.007
Gender	Male	Reference			
	Female	0.441	0.074	<.0001	1.554
Race	White	Reference			
	Non-White	0.025	0.071	0.724	1.025
Body Mass Index	18.5-39.9	Reference			
	< 18.5	0.318	0.345	0.357	1.374
	≥ 40	0.413	0.143	0.004	1.512
Status of the Procedure	Elective	Reference			
	Urgent	0.249	0.081	0.002	1.282
	Emergent	0.447	0.197	0.024	1.563
Last Creatinine Level (mg/dl)		0.316	0.218	0.147	1.372
Hypertension		0.181	0.120	0.131	1.198
Peripheral Arterial Disease		0.081	0.095	0.398	1.084
Cerebrovascular Disease		0.127	0.138	0.359	1.135
Cerebrovascular Accident (CVA) Timing	No CVA	Reference			
	> 2 weeks	0.076	0.167	0.648	1.079
	≤ 2 weeks	0.325	0.488	0.505	1.384
Diabetes Control	No diabetes/No Treatment	Reference			
	Diet Only	-0.002	0.174	0.991	0.998
	Oral	0.096	0.084	0.257	1.100
	Insulin	0.393	0.093	<.0001	1.481
	Other Subcutaneous Medication	0.991	0.584	0.089	2.695
Chronic Lung Disease	None/Mild	Reference			
	Moderate	0.197	0.143	0.169	1.218
	Severe	0.574	0.153	0.001	1.775
Immunocompromised		0.234	0.187	0.212	1.263
Dialysis		0.127	0.191	0.508	1.135
Arrhythmia Type	Afib/Flutter	0.424	0.109	0.001	1.528
Timing of Myocardial Infarction (MI)	No MI	Reference			
	21 or more days ago	-0.006	0.096	0.952	0.994
	8-21 days ago	0.123	0.141	0.385	1.131

Table D-1: Logistic Regression Risk Model for 30-Day Readmission, 2012

Risk Factor		Coefficient	Standard Error	P-value	Odds Ratio
	1-7 days ago	-0.013	0.087	0.884	0.987
	Within 24 Hours	-0.272	0.215	0.206	0.762
Heart Failure		0.259	0.095	0.007	1.296
NYHA Classification	IV vs. I,II,III	0.097	0.137	0.479	1.102
Number of Diseased Vessels	None, One or Two	Reference			
	Three or more	0.101	0.082	0.217	1.106
Mitral Insufficiency	None/Trivial/Mild	Reference			
	Moderate/Severe	0.016	0.125	0.902	1.016
Resuscitation		1.623	0.673	0.016	5.068
MELD Score	< 10	Reference			
	≥ 10	0.224	0.105	0.034	1.251

MELD: Model for End-Stage Liver Disease.

Bolded text indicates statistically significant. *Note:* Last Creatinine Level was modeled using piecewise linear transformations.

Discrimination of Risk Model for 30-Day Readmission

For the 2012 risk model, the C-statistic was 0.656. In a recently published CABG surgery readmission report by Pennsylvania (2011-2012 data), the C-statistic was 0.646,³ which is similar to the 2012 CCORP model.

Calibration of Risk Model for 30-Day Readmission

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 this 2012 risk model is 0.525, indicating adequate calibration.

Another way to test model calibration is to partition the data and compare observed readmissions with predicted readmissions in each of 10 risk groups. As presented in Table D-2, Risk Group 1 shows the patients in the lowest risk group. Among the 858 patients in this group, 55 patients were readmitted to the hospital, but the model predicted 52.2 readmissions. Assuming a Poisson distribution for a binary outcome, the predicted range of deaths for Risk Group 1 is 38.0 to 66.3. The observed number of 55 readmissions falls within the range of predicted readmissions. In fact, the 10 risk groups have neither statistically significantly fewer nor significantly more readmissions than were predicted by the model. Overall, the risk model shows no systematic underestimation or overestimation of readmission at the extremes.

³ PHC4: Technical Notes for the Cardiac Surgery Report. September 2013. Available at <http://www.phc4.org/reports/cabg/12/docs/cabg2012technotes.pdf>

Table D-2: Calibration of Risk Model for 30-day Readmission, 2012

Risk Group	Isolated CABG cases	Observed Readmission	Predicted Readmission	Difference	95%CI of predicted Readmission
1	858	55	52.2	-2.8	(38.0, 66.3)
2	859	58	61.6	3.6	(46.2, 77.0)
3	858	63	69.6	6.6	(53.2, 85.9)
4	858	63	76.7	13.7	(59.6, 93.9)
5	858	87	85.5	-1.6	(67.3, 103.6)
6	858	103	96.9	-6.1	(77.6, 116.2)
7	858	117	110.5	-6.5	(89.9, 131.1)
8	858	139	128.7	-10.3	(106.5, 150.9)
9	858	168	159.1	-8.9	(134.4, 183.8)
10	852	229	241.3	12.3	(210.8, 271.7)
Total	8,575	1,082	1082.0	0	

Note: Risk Group 1 is at lowest risk and Risk Group 10 is at highest risk.

Process for Calculating Risk-Adjusted Readmission Rate and Performance Ratings: 30-Day Readmission

The risk-adjusted readmission rate (RARR) is computed by dividing the provider's observed readmission by the provider's expected readmission (obtained from the risk model calculation) to get the observed/expected (O/E) ratio. The O/E ratio is then multiplied by the statewide readmission rate (12.24% for 2012) to obtain the provider's RARR.

However, because a provider's point estimate of the RARR can be attributed to chance, the performance rating is not based on a point estimate of the RARR, but on a comparison of the 95% confidence interval (CI) of each provider's RARR to the California average readmission rate.⁴ CCORP treated the 2012 data as samples, and inferred a range within which each provider's true performance was likely to fall. As shown in Table D-3, if the upper 95% CI of a provider's RARR is below the state average readmission rate, indicating the provider's RARR is significantly lower than the state average, the performance rating is **"Better."** If the lower 95% CI of a provider's RARR is above the state average readmission rate, indicating the provider's RARR is significantly higher than the state average, the performance rating is **"Worse."** If the state average readmission rate is within the 95% CI of a provider's RARR, the performance rating is **"Average."**

⁴ The Poisson Exact Probability method is used for computing the 95% confidence interval for the risk-adjusted readmission rate. (Buchan Iain, *Calculating Poisson Confidence Interval in Excel*, January 2004)

Statistical Details of 30-Day Risk-Adjusted Readmission Results, 2011-2012

Table D-3 presents the risk-adjusted readmission results for each hospital for 2012. The table is sorted by geographic region and contains, for each hospital, the total number of CABG surgeries performed (isolated and non-isolated combined), number of patients discharged alive after isolated CABG surgeries (excluding salvage patients), number of observed isolated CABG readmissions, observed readmission rate, expected readmission rate predicted by the risk model, risk-adjusted readmission rate (RARR) and 95% CI of the RARR, and the associated hospital performance rating.

Among the 10,553 isolated (non-salvage) CABG surgeries performed in 2012 (with patients discharged alive), 1,292 patients were readmitted to the same or another acute care hospital within 30 days of the surgery date, reflecting a statewide readmission rate of 12.24%. The observed readmission rates among hospitals ranged from 0% to 50.00%. The expected readmission rates, which are generated by the risk model and account for patient severity of illness, range between 9.39% and 16.79%. The RARR, which measure hospital performance, ranged from 0% to 36.47%.

Based on the 95% confidence intervals for risk-adjusted readmission rates, 117 of 124 hospitals (94%) performed within the expected range compared to the statewide readmission rate, three hospitals performed significantly **“Better”** than the state average, and four hospitals performed significantly **“Worse”** than the state average (Table D-3).

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Sacramento Valley & Northern California Region	Enloe Medical Center – Esplanade Campus	157	129	19	14.73	11.34	15.9	(9.57, 24.82)	Average
	Mercy General Hospital	692	400	45	11.25	11.97	11.5	(8.39, 15.39)	Average
	Mercy Medical Center – Redding	137	101	13	12.87	13.35	11.8	(6.28, 20.18)	Average
	Mercy San Juan Hospital	157	108	8	7.41	12.29	7.38	(3.18, 14.53)	Average
	Rideout Memorial Hospital	116	88	17	19.32	13.08	18.09	(10.53, 28.95)	Average
	Shasta Regional Medical Center	78	66	8	12.12	11.03	13.45	(5.81, 26.50)	Average
	St. Joseph Hospital – Eureka	23	16	0	0	13.42	0	(0.00, 21.04)	Average
	Sutter Memorial Hospital	437	286	29	10.14	12.1	10.26	(6.87, 14.73)	Average
	UC Davis Medical Center	142	97	14	14.43	12.08	14.62	(7.99, 24.53)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
San Francisco Bay Area & San Jose	Alta Bates Summit Medical Center – Summit Campus	146	92	16	17.39	12.88	16.53	(9.45, 26.84)	Average
	California Pacific Medical Center – Pacific Campus	85	56	10	17.86	11.17	19.57	(9.38, 35.99)	Average
	Community Hospital Monterey Peninsula	89	66	9	13.64	12.14	13.76	(6.29, 26.11)	Average
	Dominican Hospital – Santa Cruz/Soquel	75	52	7	13.46	11.01	14.97	(6.02, 30.84)	Average
	El Camino Hospital	83	52	5	9.62	10.2	11.54	(3.75, 26.93)	Average
	Good Samaritan Hospital - San Jose	100	71	9	12.68	11.16	13.9	(6.36, 26.38)	Average
	John Muir Medical Center – Concord Campus	273	202	11	5.45	11.84	5.63	(2.81, 10.07)	Better
	Kaiser Foundation Hospital – San Francisco	412	305	27	8.85	10.82	10.01	(6.60, 14.57)	Average
	Kaiser Foundation Hospital – Santa Clara	304	198	19	9.6	12.61	9.31	(5.61, 14.54)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
San Francisco Bay Area & San Jose (continued)	Marin General Hospital	47	34	2	5.88	11.54	6.24	(0.76, 22.54)	Average
	North Bay Medical Center	59	49	8	16.33	12.22	16.36	(7.06, 32.22)	Average
	O'Connor Hospital – San Jose	65	52	5	9.62	11.83	9.95	(3.23, 23.22)	Average
	Peninsula Medical Center	62	41	3	7.32	9.97	8.99	(1.85, 26.26)	Average
	Queen of the Valley Hospital – Napa	67	48	8	16.67	11.63	17.54	(7.57, 34.56)	Average
	Regional Medical of San Jose	75	55	7	12.73	14.34	10.87	(4.37, 22.38)	Average
	Salinas Valley Memorial Hospital	92	72	4	5.56	11.44	5.94	(1.62, 15.22)	Average
	San Ramon Regional Medical Center	34	31	0	0	11.76	0	(0.00, 12.38)	Average
	Santa Clara Valley Medical Center	101	75	9	12	11.19	13.13	(6.00, 24.92)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
San Francisco Bay Area & San Jose (continued)	Santa Rosa Memorial Hospital - Montgomery	77	55	4	7.27	11.15	7.98	(2.17, 20.44)	Average
	Sequoia Hospital	93	47	3	6.38	10.07	7.76	(1.60, 22.66)	Average
	Seton Medical Center	42	34	8	23.53	11.74	24.54	(10.59, 48.33)	Average
	St. Helena Hospital	67	50	4	8	12.5	7.84	(2.14, 20.06)	Average
	St. Mary's Medical Center – San Francisco	22	16	3	18.75	13.9	16.52	(3.41, 48.26)	Average
	Stanford Hospital	123	57	3	5.26	12.95	4.98	(1.03, 14.54)	Average
	Sutter Medical Center of Santa Rosa	88	60	5	8.33	11.48	8.89	(2.88, 20.73)	Average
	UCSF Medical Center†	81	47	7	14.89	10.22	17.84	(7.17, 36.74)	Average
	ValleyCare Medical Center	44	34	2	5.88	12.65	5.69	(0.69, 20.55)	Average
	Washington Hospital – Fremont	83	65	9	13.85	13	13.04	(5.96, 24.74)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Central California	Bakersfield Heart Hospital	100	74	12	16.22	12.39	16.02	(8.27, 27.97)	Average
	Bakersfield Memorial Hospital	147	112	14	12.5	12.79	11.96	(6.54, 20.07)	Average
	Community Regional Medical Center – Fresno	276	217	38	17.51	13	16.49	(11.67, 22.63)	Average
	Dameron Hospital	49	37	4	10.81	15.68	8.44	(2.30, 21.61)	Average
	Doctors Medical Center	270	199	20	10.05	13.97	8.81	(5.38, 13.60)	Average
	Emanuel Medical Center	18	12	0	0	10.62	0	(0.00, 35.42)	Average
	Fresno Heart and Surgical Center	224	182	20	10.99	11.59	11.61	(7.09, 17.93)	Average
	Kaweah Delta Medical Center	158	133	20	15.04	12.78	14.4	(8.79, 22.24)	Average
	Marian Medical Center	80	59	9	15.25	12.76	14.63	(6.69, 27.77)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (%), RARR	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Central California (continued)	Memorial Hospital Medical Center – Modesto	172	123	13	10.57	12.53	10.33	(5.50, 17.66)	Average
	San Joaquin Community Hospital	67	47	6	12.77	12.61	12.39	(4.55, 26.96)	Average
	St. Agnes Medical Center	277	202	21	10.4	12.54	10.15	(6.28, 15.51)	Average
	St. Joseph's Medical Center of Stockton	242	168	14	8.33	15.43	6.61	(3.61, 11.09)	Better
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara	Antelope Valley Hospital	20	18	3	16.67	10.12	20.15	(4.16, 58.89)	Average
	Community Memorial Hospital of San Buenaventura	110	87	11	12.64	11.65	13.29	(6.63, 23.78)	Average
	French Hospital Medical Center	97	57	3	5.26	11.82	5.45	(1.12, 15.93)	Average
	Glendale Adventist Medical Center – Wilson Terrace	127	101	22	21.78	12.52	21.3	(13.35, 32.24)	Worse
	Glendale Memorial Hospital and Health Center	135	110	11	10	11.81	10.37	(5.17, 18.55)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara (continued)	Los Robles Hospital and Medical Center	73	49	4	8.16	12.2	8.19	(2.23, 20.98)	Average
	Northridge Hospital Medical Center	68	49	9	18.37	11.56	19.46	(8.90, 36.93)	Average
	Palmdale Regional Medical Center	14	9	1	11.11	10.1	13.47	(0.34, 75.01)	Average
	Providence Holy Cross Medical Center	72	59	8	13.56	12.9	12.87	(5.56, 25.36)	Average
	Providence St. Joseph Medical Center	60	42	5	11.9	10.31	14.13	(4.59, 32.97)	Average
	Providence Tarzana Medical Center	50	37	7	18.92	11.43	20.27	(8.15, 41.76)	Average
	Santa Barbara Cottage Hospital	113	87	8	9.2	11.42	9.86	(4.26, 19.43)	Average
	St. John's Regional Medical Center	87	57	7	12.28	12.86	11.69	(4.70, 24.09)	Average
	Valley Presbyterian Hospital	58	46	11	23.91	10.79	27.13	(13.54, 48.53)	Worse
	West Hills Hospital and Medical Center	52	37	4	10.81	11.4	11.61	(3.16, 29.73)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Greater Los Angeles	Beverly Hospital	23	15	1	6.67	13.24	6.17	(0.16, 34.35)	Average
	California Hospital Medical Center – Los Angeles	8	8	0	0	11.21	0	(0.00, 50.33)	Average
	Cedars Sinai Medical Center	183	92	8	8.7	10.23	10.41	(4.49, 20.50)	Average
	Centinela Hospital Medical Center	28	22	4	18.18	14.07	15.82	(4.31, 40.50)	Average
	Citrus Valley Medical Center – IC Campus	134	104	10	9.62	12.89	9.13	(4.38, 16.79)	Average
	Downey Regional Medical Center	42	35	7	20	13.92	17.59	(7.07, 36.24)	Average
	Garfield Medical Center	154	98	12	12.24	13.52	11.09	(5.73, 19.37)	Average
	Good Samaritan Hospital – Los Angeles	104	65	11	16.92	14.09	14.7	(7.34, 26.30)	Average
	Henry Mayo Newhall Memorial Hospital	4	2	0	0	12.9	0	(0.00, 100.0)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Greater Los Angeles (continued)	Hollywood Presbyterian Medical Center	26	18	4	22.22	11.69	23.27	(6.34, 59.56)	Average
	Huntington Memorial Hospital	99	62	5	8.06	11.59	8.52	(2.77, 19.88)	Average
	Kaiser Foundation Hospital – Sunset	666	502	61	12.15	13.23	11.24	(8.60, 14.44)	Average
	Keck Hospital of USC	133	50	7	14	11.42	15.01	(6.03, 30.91)	Average
	Los Angeles County/ University of Southern California Medical Center	136	84	6	7.14	10.37	8.43	(3.09, 18.35)	Average
	Los Angeles County/ Harbor – UCLA Medical Center	84	51	11	21.57	12.7	20.79	(10.38, 37.19)	Average
	Lakewood Regional Medical Center	92	74	9	12.16	13.84	10.76	(4.92, 20.42)	Average
	Long Beach Memorial Medical Center	177	141	25	17.73	13.5	16.08	(10.40, 23.73)	Average
	Methodist Hospital of Southern California	59	46	1	2.17	12.93	2.06	(0.05, 11.47)	Better

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (%), RARR	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Greater Los Angeles (continued)	Presbyterian Intercommunity Hospital	134	72	5	6.94	12.95	6.57	(2.13, 15.32)	Average
	Providence Little Company of Mary Medical Center – Torrance	79	53	6	11.32	13.38	10.36	(3.80, 22.54)	Average
	Ronald Reagan UCLA Medical Center	218	94	19	20.21	14.33	17.26	(10.39, 26.95)	Average
	St. Francis Medical Center	33	25	5	20	12.8	19.13	(6.21, 44.64)	Average
	St. John's Health Center	48	30	2	6.67	11.09	7.36	(0.89, 26.58)	Average
	St. Mary Medical Center	40	30	7	23.33	13.37	21.37	(8.59, 44.01)	Average
	St. Vincent Medical Center	82	61	10	16.39	11.4	17.6	(8.44, 32.36)	Average
	Torrance Memorial Medical Center	65	35	4	11.43	13.02	10.75	(2.93, 27.51)	Average
	White Memorial Medical Center	66	55	17	30.91	13.39	28.27	(16.46, 45.25)	Worse

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Inland Empire, Riverside & San Bernardino	Desert Regional Medical Center	124	93	15	16.13	11.53	17.13	(9.58, 28.24)	Average
	Desert Valley Hospital	5	4	2	50	16.79	36.47	(4.42, 100.0)	Average
	Eisenhower Medical Center	180	131	19	14.5	11.99	14.8	(8.91, 23.11)	Average
	Loma Linda Murrieta**	47	9	NA	NA	NA	NA	NA	NA
	Loma Linda University Medical Center	231	157	25	15.92	12.82	15.21	(9.84, 22.44)	Average
	Pomona Valley Hospital Medical Center	120	102	13	12.75	12.24	12.74	(6.78, 21.79)	Average
	Riverside Community Hospital	233	185	21	11.35	11.54	12.04	(7.45, 18.40)	Average
	San Antonio Community Hospital	161	110	11	10	12.04	10.17	(5.08, 18.19)	Average
	St. Bernardine Medical Center	583	436	50	11.47	11.84	11.86	(8.80, 15.64)	Average
	St. Mary Regional Medical Center	104	84	10	11.9	13.47	10.82	(5.19, 19.90)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Orange County	AHMC Anaheim Regional Medical Center	139	75	15	20	12.08	20.26	(11.34, 33.41)	Average
	Fountain Valley Regional Hospital and Medical Center – Euclid	105	89	8	8.99	15.15	7.26	(3.13, 14.31)	Average
	Hoag Memorial Hospital Presbyterian	198	107	14	13.08	11.74	13.64	(7.45, 22.88)	Average
	Mission Hospital Regional Medical Center	142	105	9	8.57	11.28	9.31	(4.25, 17.66)	Average
	Orange Coast Memorial Medical Center	74	51	6	11.76	9.9	14.54	(5.34, 31.64)	Average
	Saddleback Memorial Medical Center	83	66	8	12.12	11.45	12.96	(5.59, 25.52)	Average
	St. Joseph Hospital – Orange	108	67	4	5.97	11.96	6.11	(1.67, 15.65)	Average
	St. Jude Medical Center	100	86	5	5.81	11.97	5.95	(1.93, 13.88)	Average
	UC Irvine Medical Center	65	43	7	16.28	14.18	14.05	(5.65, 28.95)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Orange County (continued)	West Anaheim Medical Center	21	13	2	15.38	11.97	15.73	(1.90, 56.81)	Average
	Western Medical Center – Santa Ana	60	41	4	9.76	13.45	8.88	(2.42, 22.73)	Average
	Western Medical Center Hospital – Anaheim	70	48	7	14.58	13.98	12.77	(5.13, 26.30)	Average
Greater San Diego	Alvarado Hospital Medical Center†	40	30	10	33.33	13.5	30.24	(14.50, 55.59)	Worse
	Grossmont Hospital	177	119	20	16.81	14.3	14.39	(8.79, 22.22)	Average
	Palomar Medical Center	67	44	6	13.64	14.56	11.47	(4.21, 24.95)	Average
	Scripps Green Hospital	68	30	6	20	11.44	21.4	(7.85, 46.57)	Average
	Scripps Memorial Hospital - La Jolla	294	187	20	10.7	11.38	11.51	(7.03, 17.77)	Average
	Scripps Mercy Hospital	165	115	14	12.17	13.17	11.31	(6.18, 18.98)	Average

Table D-3: Hospital Risk-Adjusted Readmission Results by Region, 2012

Region	Hospital	All CABG Cases	Isolated CABG Cases, Discharged Alive	Isolated CABG Readmissions	Observed Readmission Rate (%)	Expected Readmission Rate (%)	Risk-Adjusted Readmission Rate (% RARR)	95%CI for RARR	Performance Rating
State		15,193	10,553	1,292	12.24				
Greater San Diego (continued)	Sharp Chula Vista Medical Center	116	76	12	15.79	14.66	13.19	(6.81, 23.03)	Average
	Sharp Memorial Hospital	138	70	4	5.71	11.57	6.05	(1.65, 15.48)	Average
	Tri-City Medical Center	95	74	15	20.27	12.77	19.43	(10.87, 32.03)	Average
	UC San Diego Health – Sulpizio Cardiovascular Center	119	65	6	9.23	11.61	9.73	(3.57, 21.18)	Average

*A hospital is classified as **“Better”** if the upper 95% CI of the RARR falls below the California observed readmission rate (12.24%). A hospital is classified as **“Worse”** if the lower 95% CI of the RARR is higher than the California observed readmission rate. A hospital’s performance is considered **“Average”** if the California readmission rate falls within the 95% CI of a hospital’s RARR.

** Hospital results are not shown because data necessary to confirm deaths and readmissions was not available.

† Hospitals submitted statements regarding this report. See Appendix C for their statements.

Statistical Details for Internal Mammary Artery Usage by Hospital, 2012: A Process Measure of Quality

A widely accepted definition of healthcare quality contains three dimensions: process, structure, and outcomes.⁵ In addition to publishing hospital outcomes, this report also assesses a process of care measure by reporting hospital use of the internal mammary artery (IMA) in surgery. Although outcomes measurement permits comparison of provider performance and can be used for investigating internal processes and structures, assessing the process 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 health 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 IMA (also known as the internal thoracic artery). Clinical literature strongly supports use of the IMA to promote long-term graft patency (durability) and patient survival. Recent research also suggests a reduction in immediate operative mortality associated with use of the internal mammary artery rather than saphenous (leg) vein revascularization.⁶ The IMA, and especially the left IMA, is considered the preferred conduit for CABG surgery of the left anterior descending (LAD) coronary artery.

Many nationally respected organizations encourage the use of IMA when appropriate. Currently, the Leapfrog Evidence-Based Hospital Referral program endorses the goal of 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 IMA use should be given primary consideration in every CABG surgery patient. Furthermore, a number of healthcare quality advocates recommend public reporting of IMA usage rates for CABG surgery.

Table E-1 presents hospital results by region for usage of the IMA during 2012. *Only first-time isolated CABG surgeries where the operative status is elective or urgent and the LAD was bypassed are included in calculating IMA usage rates.* The statewide IMA usage rate was virtually unchanged (96.6% in 2011 vs. 96.5% in 2012). Seven hospitals received a “**Low**” rating for 2012. Hospital IMA usage rates above the statewide average rate are not rated because there is no consensus on what constitutes an optimal IMA usage rate.

Definitions of Table E-1 Terms

Isolated CABG Surgeries: Includes only first-time, non-cardiogenic shock, isolated CABG surgeries for 2012 where the operative status was elective or urgent and the left anterior descending (LAD) artery was bypassed. This number is usually 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

⁵ Donabedian A. Evaluating the Quality of Medical Care. *The Milbank Quarterly*, 2005; 83(4):691-729.

⁶ 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.

IMA use = Number of IMA Grafts used for First-Time Isolated CABG Surgeries/Number of First-Time Isolated CABG Cases × 100.

Performance 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 85.9%, i.e., two standard deviations (0.054×1.96) below the hospital statewide average IMA usage rate (96.5%). 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 E-1: Hospital Internal Mammary Artery Usage Results by Region, 2012

Region	Hospital	Isolated CABGs*	Percent IMA Use	Rank**
State	All Hospitals	10,527	96.50%	
Sacramento Valley & Northern California Region	Enloe Medical Center – Esplanade Campus	113	97.35%	
	Mercy General Hospital	419	98.81%	
	Mercy Medical Center – Redding	81	100.00%	
	Mercy San Juan Hospital	99	98.99%	
	Rideout Memorial Hospital	84	100.00%	
	Shasta Regional Medical Center	61	81.97%	Low
	St. Joseph Hospital – Eureka	17	82.35%	Low
	Sutter Memorial Hospital	301	97.34%	
	UC Davis Medical Center	93	100.00%	
San Francisco Bay Area & San Jose	Alta Bates Summit Medical Center – Summit Campus	106	99.06%	
	California Pacific Medical Center – Pacific Campus	60	98.33%	
	Community Hospital Monterey Peninsula	63	100.00%	
	Dominican Hospital – Santa Cruz/Soquel	55	89.09%	
	El Camino Hospital	54	100.00%	
	Good Samaritan Hospital – San Jose	70	97.14%	
	John Muir Medical Center – Concord Campus	200	97.50%	
	Kaiser Foundation Hospital – San Francisco	302	97.68%	
	Kaiser Foundation Hospital – Santa Clara	189	98.94%	
	Marin General Hospital	40	85.00%	Low
	North Bay Medical Center	50	98.00%	
	O’Connor Hospital – San Jose	53	100.00%	
	Peninsula Medical Center	44	97.73%	

Table E-1: Hospital Internal Mammary Artery Usage Results by Region, 2012

Region	Hospital	Isolated CABGs*	Percent IMA Use	Rank**
State	All Hospitals	10,527	96.50%	
San Francisco Bay Area & San Jose (continued)	Queen of the Valley Hospital – Napa	53	98.11%	
	Regional Medical of San Jose	56	100.00%	
	Salinas Valley Memorial Hospital	66	100.00%	
	San Ramon Regional Medical Center	31	100.00%	
	Santa Clara Valley Medical Center	86	97.67%	
	Santa Rosa Memorial Hospital – Montgomery	57	87.72%	
	Sequoia Hospital	46	100.00%	
	Seton Medical Center	36	97.22%	
	St. Helena Hospital	38	89.47%	
	St. Mary's Medical Center – San Francisco	17	100.00%	
	Stanford Hospital	63	96.83%	
	Sutter Medical Center of Santa Rosa	53	67.92%	Low
	UCSF Medical Center†	53	100.00%	
	ValleyCare Medical Center	37	91.89%	
	Washington Hospital – Fremont	68	100.00%	
Central California	Bakersfield Heart Hospital	73	93.15%	
	Bakersfield Memorial Hospital	109	93.58%	
	Community Regional Medical Center – Fresno	202	99.50%	
	Dameron Hospital	32	93.75%	
	Doctors Medical Center	200	95.50%	
	Emanuel Medical Center	13	100.00%	
	Fresno Heart and Surgical Center	165	98.18%	
	Kaweah Delta Medical Center	132	98.48%	
	Marian Medical Center	51	98.04%	
	Memorial Hospital Medical Center – Modesto	122	90.16%	
	San Joaquin Community Hospital	51	94.12%	
	St. Agnes Medical Center	195	98.46%	
	St. Joseph's Medical Center of Stockton	143	95.80%	

Table E-1: Hospital Internal Mammary Artery Usage Results by Region, 2012

Region	Hospital	Isolated CABGs*	Percent IMA Use	Rank**
State	All Hospitals	10,527	96.50%	
San Fernando Valley, Antelope Valley, Ventura & Santa Barbara	Antelope Valley Hospital	18	77.78%	Low
	Community Memorial Hospital of San Buenaventura	86	97.67%	
	French Hospital Medical Center	50	100.00%	
	Glendale Adventist Medical Center – Wilson Terrace	107	99.07%	
	Glendale Memorial Hospital and Health Center	110	100.00%	
	Los Robles Hospital and Medical Center	45	97.78%	
	Northridge Hospital Medical Center	54	98.15%	
	Palmdale Regional Medical Center	11	90.91%	
	Providence Holy Cross Medical Center	50	100.00%	
	Providence St. Joseph Medical Center	42	100.00%	
	Providence Tarzana Medical Center	33	96.97%	
	Santa Barbara Cottage Hospital	87	100.00%	
	St. John's Regional Medical Center	63	98.41%	
	Valley Presbyterian Hospital	44	97.73%	
	West Hills Hospital and Medical Center	35	100.00%	
Greater Los Angeles	Beverly Hospital	20	95.00%	
	California Hospital Medical Center – Los Angeles	8	100.00%	
	Cedars Sinai Medical Center	98	100.00%	
	Centinela Hospital Medical Center	21	100.00%	
	Citrus Valley Medical Center – IC Campus	99	95.96%	
	Downey Regional Medical Center	31	93.55%	
	Garfield Medical Center	119	92.44%	
	Good Samaritan Hospital – Los Angeles	76	97.37%	
	Henry Mayo Newhall Memorial Hospital	2	100.00%	
	Hollywood Presbyterian Medical Center	20	100.00%	
	Huntington Memorial Hospital	63	98.41%	
	Kaiser Foundation Hospital – Sunset	481	96.47%	

Table E-1: Hospital Internal Mammary Artery Usage Results by Region, 2012

Region	Hospital	Isolated CABGs*	Percent IMA Use	Rank**
State	All Hospitals	10,527	96.50%	
Greater Los Angeles (continued)	Keck Hospital of USC	50	100.00%	
	Los Angeles County/ University of Southern California Medical Center	112	98.21%	
	Los Angeles County/ Harbor – UCLA Medical Center	64	98.44%	
	Lakewood Regional Medical Center	72	95.83%	
	Long Beach Memorial Medical Center	136	92.65%	
	Methodist Hospital of Southern California	45	100.00%	
	Presbyterian Intercommunity Hospital	66	95.45%	
	Providence Little Company of Mary Medical Center – Torrance	50	98.00%	
	Ronald Reagan UCLA Medical Center	89	96.63%	
	St. Francis Medical Center	25	76.00%	Low
	St. John's Health Center	27	96.30%	
	St. Mary Medical Center	28	100.00%	
	St. Vincent Medical Center	64	96.88%	
	Torrance Memorial Medical Center	30	100.00%	
	White Memorial Medical Center	56	100.00%	
Inland Empire, Riverside & San Bernardino	Desert Regional Medical Center	83	97.59%	
	Desert Valley Hospital	4	75.00%	Low
	Eisenhower Medical Center	134	91.04%	
	Loma Linda Murrieta	36	100.00%	
	Loma Linda University Medical Center	157	98.73%	
	Pomona Valley Hospital Medical Center	90	100.00%	
	Riverside Community Hospital	169	97.04%	
	San Antonio Community Hospital	104	99.04%	
	St. Bernardine Medical Center	487	97.95%	
	St. Mary Regional Medical Center	75	94.67%	
Orange County	AHMC Anaheim Regional Medical Center	91	97.80%	
	Fountain Valley Regional Hospital and Medical Center – Euclid	85	95.29%	
	Hoag Memorial Hospital Presbyterian	92	97.83%	

Table E-1: Hospital Internal Mammary Artery Usage Results by Region, 2012

Region	Hospital	Isolated CABGs*	Percent IMA Use	Rank**
State	All Hospitals	10,527	96.50%	
Orange County (continued)	Mission Hospital Regional Medical Center	101	98.02%	
	Orange Coast Memorial Medical Center	55	96.36%	
	Saddleback Memorial Medical Center	56	96.43%	
	St. Joseph Hospital – Orange	70	100.00%	
	St. Jude Medical Center	80	97.50%	
	UC Irvine Medical Center	50	96.00%	
	West Anaheim Medical Center	18	94.44%	
	Western Medical Center – Santa Ana	24	100.00%	
	Western Medical Center Hospital – Anaheim	49	97.96%	
Greater San Diego	Alvarado Hospital Medical Center†	29	100.00%	
	Grossmont Hospital	123	98.37%	
	Palomar Medical Center	42	97.62%	
	Scripps Green Hospital	30	100.00%	
	Scripps Memorial Hospital – La Jolla	198	99.49%	
	Scripps Mercy Hospital	123	99.19%	
	Sharp Chula Vista Medical Center	76	100.00%	
	Sharp Memorial Hospital	71	97.18%	
	Tri-City Medical Center	70	97.14%	
	UC San Diego Health – Sulpizio Cardiovascular Center	66	100.00%	

* Only includes first-time, non-cardiogenic shock, isolated CABGs where the operative status was elective or urgent and LAD was bypassed.

**Low Rank: IMA usage rate for a hospital is less than 85.92%, i.e., two standard deviations (0.054x1.96) below the hospital statewide average IMA usage rate (96.50%)

Appendix A: Definition of Terms

All CABG Cases: The total number of isolated and non-isolated CABG cases submitted to CCORP. To improve statistical reliability, some measures combine data from two years.

Hospital Operative Mortality: 2012

Hospital Post-Operative Stroke: 2011-2012

Hospital 30-day Readmission: 2012

Surgeon Operative Mortality: 2011 and 2012

Non-isolated CABG cases are excluded from the performance rating calculations.

Isolated CABG Cases: The number of isolated CABG cases submitted to CCORP during the time period indicated for the outcome listed above. All patients in salvage operative status are excluded from the isolated CABG cases, thus only isolated CABG cases without salvage operative status are used to calculate performance ratings.

Responsible Surgeon: The principle surgeon who performs a CABG procedure. In situations in which a responsible surgeon cannot otherwise be determined, the responsible surgeon is the surgeon who bills for the procedure. See page 34 of the training manual for more detailed definition:

http://www.oshpd.ca.gov/HID/SubmitData/CCORP_CABG/TrainingManual_2ndHalf2011.pdf.

Isolated CABG Outcomes:

Operative Mortality (hospital and surgeon): The 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, including those occurring after 30 days; and 2) all deaths occurring within 30 days after the CABG surgery.

Post-Operative Strokes: The number of post-operative strokes that were unresolved after 24 hours for isolated CABG cases for the time period indicated.

30-day Readmission (for Isolated CABG Cases Discharged Alive): The number of hospital readmissions within 30 days of being discharged from the hospital where an isolated CABG operation was performed, irrespective of the hospital to which they were readmitted. A readmission was included only if the patient was readmitted with a principal diagnosis that indicated a heart-related condition, an infection, or a complication that was likely related to the CABG surgery. Readmission was attributed to the hospital performing the initial CABG surgery.

Observed CABG Outcome Rate: The ratio of the number of isolated CABGs with an outcome (operative deaths or post-operative strokes) and the number of isolated CABG cases multiplied by 100: Observed Outcome Rate (operative death or post-operative stroke) = Isolated CABG Cases with Outcome/Isolated CABG Cases × 100.

The *observed CABG readmission* rate is calculated a little differently--the ratio of the number of isolated CABG readmissions within 30 days of discharge and the number of discharged-alive isolated CABG cases multiplied by 100: Observed Readmission Rate = Isolated CABG Readmissions within 30 Days of Discharge/Discharged-Alive Isolated CABG Cases × 100.

Expected CABG Outcome Rate: The ratio of the expected number of outcomes (operative deaths or post-operative strokes) predicted for a provider (after risk adjusting for the provider's patient population) and the number of isolated CABG cases multiplied by 100: $\text{Expected CABG Outcome Rate} = \text{Expected CABG Outcomes} / \text{Isolated CABG Cases} \times 100$.

For the *expected CABG readmission rate*: The ratio of the expected number of readmissions predicted for a provider (after adjusting for their patient population) and the number of discharged-alive isolated CABG cases multiplied by 100: $\text{Expected Readmission Rate} = \text{Expected Readmissions} / \text{Discharged-Alive Isolated CABG Cases} \times 100$.

Risk-Adjusted Outcome Rate (95% CI): The risk-adjusted outcome rate (Mortality Rate [RAMR]; Post-Operative Stroke Rate [RASR]; or Readmission Rate [RARR]) is obtained by multiplying the California observed CABG outcome rate by the provider's relevant Observed/Expected ratio. The 95% confidence interval represents the confidence we have in the estimate for the risk-adjusted rate. The lower and upper confidence limits are calculated using Poisson exact confidence interval calculations.

Performance Rating: The performance rating is based on a comparison of each provider's risk-adjusted outcome rate and the California observed outcome rate. This is a test of statistical significance. A provider is classified as "**Better**" if the upper 95% confidence limit of its rate falls below the California observed rate. A provider is classified as "**Worse**" if the lower 95% confidence limit of its outcome rate is higher than the California observed rate. A provider is classified as "**Average**" if the California outcome rate falls within the confidence interval of the provider's risk-adjusted outcome rate.

Appendix B: Definition of Readmission

A readmission was counted only if the patient was readmitted with a principal diagnosis (i.e., the reason for the readmission) that indicated a heart-related condition, or an infection or a complication that was likely related to the CABG surgery hospitalization. California adopted the diagnosis categories and associated ICD-9-CM codes for readmissions that are used by the Pennsylvania Healthcare Cost Containment Council. The following list of categories shows the ICD-9-CM codes that were counted as readmissions if the code was located in the principal diagnosis position (<http://www.phc4.org/reports/cabg/09/docs/cabg2009technotes.pdf>).

CIRCULATORY SYSTEM

Cardiac Dysrhythmias

Heart Block: 426.0, 426.10, 426.11, 426.12, 426.13, 426.2, 426.3, 426.4, 426.50, 426.51, 426.52, 426.53, 426.54, 426.6, 426.7, 426.81, 426.82, 426.89, 426.9
 Paroxysmal Tachycardia: 427.0, 427.1, 427.2
 Atrial Fibrillation and Atrial Flutter: 427.31, 427.32
 Ventricular Fibrillation and Ventricular Flutter: 427.41, 427.42, 427.5
 Premature Heart Beats: 427.60, 427.61, 427.69
 Other Cardiac Dysrhythmias: 427.81, 427.89, 427.9

Heart Failure: 398.91, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9

Functional Disturbances Follow Cardiac Surgery (Postcardiotomy Syndrome): 429.4

Hypertension and Hypotension

Essential Hypertension: 401.0, 401.1, 401.9
 Hypertensive Heart Disease: 402.00, 402.01, 402.10, 402.11, 402.90, 402.91
 Hypertensive Chronic Kidney Disease: 403.00, 403.01, 403.10, 403.11, 403.90, 403.91
 Hypertensive Heart and Chronic Kidney Disease: 404.00, 404.01, 404.02, 404.03, 404.10, 404.11, 404.12, 404.13, 404.90, 404.91, 404.92, 404.93
 Secondary Hypertension: 405.01, 405.09, 405.11, 405.19, 405.91, 405.99
 Hypotension: 458.0, 458.1, 458.21, 458.29, 458.8, 458.9, 796.3

Myocardial Infarction and Ischemia

Acute Myocardial Infarction, Initial Episode: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91
 Acute Myocardial Infarction, Unspecified or Subsequent Episode: 410.00, 410.02, 410.10, 410.12, 410.20, 410.22, 410.30, 410.32, 410.40, 410.42, 410.50, 410.52, 410.60, 410.62, 410.70, 410.72, 410.80, 410.82, 410.90, 410.92
 Other Forms of Myocardial Ischemia: 411.0, 411.81, 411.89, 429.79

Angina Pectoris and Chest Pain: 411.1, 413.0, 413.1, 413.9, 786.50, 786.51, 786.59

Atherosclerosis

Coronary Atherosclerosis: 414.00, 414.01, 414.02, 414.03, 414.04, 414.05, 414.06, 414.07, 414.2, 414.3
 Other Atherosclerosis: 429.2, 440.0, 440.1, 440.20, 440.21, 440.22, 440.23, 440.24, 440.29, 440.30, 440.31, 440.32, 440.8, 440.9

Heart Aneurysm and Dissection: 414.10, 414.11, 414.12, 414.19

Pericarditis, Endocarditis and Myocarditis: 397.9, 398.0, 420.90, 420.91, 420.99, 421.0, 421.9, 422.90, 422.91, 422.92, 422.93, 422.99, 423.1, 423.2, 423.3, 423.8, 423.9, 424.90, 424.99, 429.0, 429.1

Heart Valve Disease

Mitral Valve Disease: 394.0, 394.1, 394.2, 394.9, 424.0
 Aortic Valve Disease: 395.0, 395.1, 395.2, 395.9, 424.1
 Tricuspid Valve Disease: 397.0, 424.2
 Pulmonary Valve Disease: 397.1, 424.3
 Multiple Valve Disease: 396.0, 396.1, 396.2, 396.3, 396.8, 396.9
 Other Endocardial Structure Disease: 429.5, 429.6, 429.71, 429.81

Cardiomyopathies: 425.0, 425.1, 425.3, 425.4, 425.9

Other Aneurysm and Dissection

Aortic Aneurysm and Dissection: 441.00, 441.01, 441.02, 441.03, 441.1, 441.2, 441.3, 441.4, 441.5, 441.6, 441.7, 441.9

Other Arterial Aneurysm: 442.0, 442.1, 442.2, 442.3, 442.81, 442.82, 442.83, 442.84, 442.89, 442.9
Other Arterial Dissection: 443.21, 443.22, 443.23, 443.24, 443.29

Arterial Embolism and Thrombosis

Abdominal and Thoracic Aorta: 444.0, 444.1
Arteries of the Extremities: 444.21, 444.22, 445.01, 445.02
Other Arteries Excluding Precerebral and Cerebral Arteries: 444.81, 444.89, 444.9, 445.81, 445.89, 449, 593.81

Venous Embolism and Thrombosis

Lower Extremity Venous Embolism and Thrombosis: 453.40, 453.41, 453.42
Renal Vein Embolism and Thrombosis: 453.3
Other Venous Embolism and Thrombosis: 453.8, 453.9

Phlebitis and Thrombophlebitis

Lower Extremity Phlebitis and Thrombophlebitis: 451.0, 451.11, 451.19, 451.2
Upper Extremity Phlebitis and Thrombophlebitis: 451.82, 451.83, 451.84
Other Vessel Phlebitis and Thrombophlebitis: 451.81, 451.89, 451.9

Occlusion and Stenosis

Precerebral Artery Occlusion and Stenosis: 433.00, 433.20, 433.30, 433.80, 433.90
Cerebral Artery Occlusion and Stenosis: 433.10, 434.00, 434.10, 434.90
Retinal Artery Occlusion and Visual Loss: 362.30, 362.31, 362.32, 362.33, 362.34, 362.35, 362.36, 362.37, 368.11, 368.12, 368.40

Other Diseases and Symptoms of the Circulatory System: 398.90, 398.99, 414.8, 414.9, 423.0, 429.3, 429.82, 429.89, 429.9, V533.1, V533.2, V533.9

RESPIRATORY SYSTEM

Pulmonary Embolism and Infarction

Pulmonary Embolism and Infarction: 415.0, 415.12, 415.19
Postoperative Pulmonary Embolism and Infarction: 415.11

Pleural Effusion and Atelectasis: 511.0, 511.8, 511.89, 511.9, 518.0

Pneumothorax

Pneumothorax: 512.0, 512.8
Postoperative Pneumothorax: 512.1

Pulmonary Edema: 514, 518.4, 518.5

Acute Respiratory Failure: 518.81, 518.82, 518.84, 799.1

Other Diseases and Symptoms of the Respiratory System: 518.1, 519.19, 519.2, 733.6, 786.00, 786.02, 786.04, 786.05, 786.06, 786.09, 786.3, 786.52, 786.6, 786.7, 786.8, 786.9, 998.81

NERVOUS SYSTEM

Stroke

Ischemic Stroke: 433.01, 433.11, 433.21, 433.31, 433.81, 433.91, 434.01, 434.11, 434.91
Hemorrhagic Stroke: 430, 431, 432.0, 432.1, 432.9
Transient Cerebral Ischemia: 435.0, 435.1, 435.2, 435.3, 435.8, 435.9
Postoperative Stroke: 997.02

Encephalopathies: 348.30, 348.31, 348.39, 349.82, 437.2

Cerebral Edema and Brain Compression: 348.4, 348.5

Anoxic Brain Damage: 348.1

Coma and Stupor: 780.01, 780.03, 780.09

Postoperative Pain: 338.12, 338.18

Other Diseases and Symptoms of the Nervous System: 336.1, 436, 780.2, 780.4, 780.97

DIGESTIVE SYSTEM

Ischemic Bowel and Vascular Insufficiency of the Intestine: 557.0, 557.9

Intestinal Obstruction and Ileus: 560.1, 560.81, 560.89, 560.9

Ulceration, Bleeding and Perforation of the Digestive System: 528.00, 528.02, 528.09, 530.10, 530.12, 530.20, 530.21, 530.82, 531.00, 531.01, 531.10, 531.11, 531.20, 531.21, 531.30, 531.31, 531.40, 531.41, 531.50, 531.51, 531.60, 531.61, 531.70, 531.71, 531.90, 531.91, 532.00, 532.01, 532.10, 532.11, 532.20, 532.21, 532.30, 532.31, 532.40, 532.41, 532.50, 532.51, 532.60, 532.61, 532.70, 532.71, 532.90, 532.91, 533.00, 533.01, 533.10, 533.11, 533.20, 533.21, 533.30, 533.31, 533.40, 533.41, 533.50, 533.51, 533.60, 533.61, 533.70, 533.71, 533.90, 533.91, 534.00, 534.01, 534.10, 534.11, 534.20, 534.21, 534.30, 534.31, 534.40, 534.41, 534.50, 534.51, 534.60, 534.61, 534.70, 534.71, 534.90, 534.91, 535.00, 535.01, 535.40, 535.41, 535.50, 535.51, 535.60, 535.61, 569.3, 569.82, 569.83, 578.9

Acute Liver Failure: 570, 572.2

Other Diseases and Symptoms of the Digestive System: 560.30, 560.39, 568.81, 577.0, 578.0, 578.1

URINARY SYSTEM

Acute Glomerulonephritis and Pyelonephritis: 580.0, 580.4, 580.89, 580.9, 590.10, 590.11, 590.80

Nephrotic Syndrome: 581.0, 581.1, 581.2, 581.3, 581.89, 581.9

Acute Renal Failure: 584.5, 584.6, 584.7, 584.8, 584.9

Other Diseases and Symptoms of the Urinary System: 593.9, 599.7, 599.70, 599.71, 599.72, 788.20, 788.29

COMPLICATIONS OF SURGICAL AND MEDICAL CARE

Mechanical Complication of Cardiac Device, Implant and Graft

Mechanical Complication of Cardiac Pacemaker and AICD: 996.00, 996.01, 996.04

Mechanical Complication of Heart Valve Prosthesis: 996.02

Mechanical Complication of Coronary Artery Bypass Graft: 996.03

Other and Unspecified Mechanical Complication: 996.09, 996.1, 996.59

Other Complication of Internal Prosthetic Device, Implant and Graft

Other Complication of Heart Valve Prosthesis: 996.71

Other Complication of Other Cardiac Device, Implant and Graft: 996.72

Other Complication of Vascular Device, Implant and Graft: 996.74

Shock

Postoperative Shock: 998.0

Cardiogenic Shock: 785.51

Other Shock: 785.50, 785.59

Hemorrhage and Hematoma Complicating a Procedure: 459.0, 998.11, 998.12, 998.13

Foreign Body Accidentally Left or Accidental Laceration During a Procedure: 998.2, 998.4, 998.7

Dehiscence and Rupture of Operation Wound: 998.31, 998.32, 998.6, 998.83

Other Complications of Surgical and Medical Care

Nervous System Complication: 997.00, 997.01, 997.09

Circulatory System Complication: 997.1, 997.2, 997.71, 997.72, 997.79, 999.1, 999.2

Respiratory System Complication: 519.00, 519.02, 519.09, 997.3, 997.39

Digestive System Complication: 536.40, 536.42, 536.49, 997.4

Urinary System Complication: 997.5

Other Complications: 998.89, 998.9, 999.8, 999.89

INFECTIONS

Postoperative Infections: 997.31, 998.51, 998.59, 99.3, 999.31, 999.39

Sepsis and Bacteremia: 038.0, 038.10, 038.11, 038.12, 038.19, 038.2, 038.3, 038.40, 038.41, 038.42, 038.43, 038.44, 038.49, 038.8, 038.9, 785.52, 790.7, 995.90, 995.91, 995.92

Pneumonia

Pneumonia: 481, 482.0, 482.1, 482.2, 482.30, 482.31, 482.32, 482.39, 482.40, 482.41, 482.42, 482.49, 482.81, 482.82, 482.83, 482.84, 482.89, 482.9, 485, 486, 511.1
Aspiration Pneumonia: 507.0
Empyema and Abscess of Lung: 510.0, 510.9, 513.0, 513.1

Infection due to Device, Implant and Graft

Cardiac Device, Implant and Graft: 996.61
Vascular Device, Implant and Graft: 996.62
Other and Unspecified Infections due to Device, Implant and Graft: 519.01, 536.41

Urinary Tract Infection: 590.3, 590.9, 595.0, 599.0, 996.64

Cellulitis: 681.00, 681.01, 681.02, 681.10, 681.11, 681.9, 682.0, 682.1, 682.2, 682.3, 682.4, 682.5, 682.6, 682.7, 682.8, 682.9

Osteomyelitis: 730.03, 730.06, 730.07, 730.08, 730.09

Intestinal Infection due to Clostridium difficile: 008.45

Other Infection Related Conditions and Symptoms: 567.21, 567.29, 567.9, 590.2, 780.6, 780.60, 780.61, 780.62

FLUID AND ELECTROLYTE IMBALANCE

Hyperosmolality and Hyposmolality: 276.0, 276.1

Acidosis and Alkalosis: 276.2, 276.3, 276.4

Dehydration and Hypovolemia: 276.50, 276.51, 276.52

Fluid Overload: 276.6

Hyperpotassemia and Hypopotassemia: 276.7, 276.8

Other Electrolyte and Fluid Disorders: 276.9

ANEMIA AND COAGULATION DEFECTS

Anemia

Acute Posthemorrhagic Anemia: 285.1
Anemia: 280.0, 285.8, 285.9

Coagulation Defects

Hemorrhagic Disorders due to Anticoagulants: 286.5
Thrombocytopenia: 287.4, 287.5, 289.84, 446.6
Other Coagulation Defects: 286.6, 286.7, 286.9, 289.82, 790.92

Appendix C: Acknowledgments

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