The California Report on Coronary Artery Bypass Graft (CABG) Surgery 2013-2014: Hospital and Surgeon Data

Coronary artery bypass graft (CABG) surgery is one of the most expensive and common cardiac surgeries performed in California. Improved medical interventions and quality improvement efforts have contributed to a declining mortality rate over the last 15 years. However, post-operative death and major complications (e.g. stroke, surgical site infections) still occur at rates that can and should be reduced. The intent of this report is to help improve quality outcomes and appropriateness of CABG surgery by informing potential consumers, hospitals, surgeons and others about the performance of hospitals and surgeons.

The California Report on Coronary Artery Bypass Graft (CABG) Surgery 2013-2014: Hospital and Surgeon Data provides quality ratings for the 127 California-licensed hospitals performing adult isolated CABG1 or CABG + Valve2 surgery and 271 surgeons performing adult isolated CABG surgery during 2013 and 2014. Hospital results for isolated CABG operative mortality and internal mammary artery (IMA)3 utilization are based on calendar year 2014 data. Hospital results for CABG + Valve operative mortality and isolated-CABG post-operative stroke are based on combined 2013-2014 calendar year data to increase statistical reliability. Surgeon results for isolated CABG operative mortality also are calculated using 2013 and 2014 calendar year data to improve statistical reliability.

The outcome measures are risk-adjusted, a statistical technique that enables fair comparison of hospitals and surgeons even though some treat sicker patients.

- **Isolated CABG operative mortality** includes all deaths that occurred during the hospitalization in which the CABG surgery was performed (regardless of length of stay) and any deaths within 30 days after the surgery (no matter where they occurred).

- **CABG + Valve operative mortality** includes all deaths as defined above.

- **Post-operative stroke** is defined as a central neurologic deficit that occurred after the surgery and did not resolve within 24 hours. This measure only applies to isolated CABG surgeries.

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1 Isolated CABG surgery refers to heart bypass surgery without other major surgery, such as heart or lung transplantation, valve repair, etc. performed concurrently with the bypass procedure. Patients undergoing CPR en route to the operating room are excluded.

2 CABG + Valve surgery refers to heart bypass surgery that also includes repair or replacement of the mitral valve and/or aortic valve. Patients with salvage operative status are excluded.

3 The internal mammary artery (IMA) supplies blood to the front chest wall and the breasts. It is a paired artery, running on each side of the inner chest. Evidence shows that the IMA, when grafted to a coronary artery, is less susceptible to obstruction over time and remains fully open longer than vein grafts.
Also included in this report is the internal mammary artery (IMA) utilization rate for hospitals. Research shows that high rates of IMA use result in long-term graft patency and improved patient survival, making it an important process measure of surgical quality.4

All hospitals listed in this report were given an opportunity to review their results prior to publication. One hospital submitted a comment letter, which can be viewed by clicking the hospital name with † in this report. These statements may help readers understand the concerns of healthcare providers regarding their performance information.

Surgeons who felt that their operative mortality results did not reflect the quality of care provided were able to submit appeals requesting a review along with information supporting their position to OSHPD staff. Appeals that could not be resolved were forwarded to the CCORP Clinical Advisory Panel (CAP) for a final decision. All appeals were resolved in a public meeting prior to release of this report.

2013-2014 Hospital Operative Mortality Findings

2014 Isolated CABG Operative Mortality

The operative mortality rate for isolated CABG surgery in California was 1.97 percent in 2014 (239 deaths after 12,152 procedures). This rate decreased from 2.29 percent in 2013, and represents a 32.30 percent reduction since 2003 (2.91 percent), the first year of mandated public reporting.

- After adjusting for patients’ pre-operative health conditions, 98.43 percent of all hospitals performed within the statistically acceptable range of the state average; no hospital was rated “Better.”

- After adjusting for patients’ pre-operative health conditions, two hospitals were rated “Worse” than the state average operative mortality rate (Community Regional Medical Center – Fresno and Desert Regional Medical Center).

2013-2014 CABG + Valve Operative Mortality

The operative mortality rate for CABG + Valve surgery in California was 5.59 percent in 2013-2014 (293 deaths after 5,239 procedures). This rate decreased slightly from 6.00 percent in 2012-2013, a 6.83 percent reduction.

- After adjusting for patients’ pre-operative health conditions, six hospitals were rated “Better” than the state average operative mortality rate (Eisenhower Medical Center, Kaiser Foundation – San Francisco, Mercy General Hospital, Presbyterian Intercommunity Hospital, Scripps Memorial Hospital – La Jolla, and Sequoia Hospital).

- After adjusting for patients’ pre-operative health conditions, one hospital was rated “Worse” than the state average operative mortality rate (Dominican Hospital – Santa Cruz/Soquel).

4 IMA utilization was assessed only for first-time, isolated CABG surgeries where the operative status was elective or urgent and the left anterior artery was bypassed.
2013-2014 Hospital Post-Operative Stroke Findings

The post-operative stroke rate for isolated CABG surgery in California was 1.28 percent (308 strokes after 24,092 procedures) during 2013-2014. This represents a 10.48 percent decrease in California’s average post-operative stroke rate since 2007-2008 when the rate was 1.43 percent.

- After adjusting for patients’ pre-operative health conditions, one hospital was rated “Better” than the state average post-operative stroke rate (St. Bernardine Medical Center).
- Two hospitals were rated “Worse” than the state average post-operative stroke rate (Sharp Memorial Hospital† and Shasta Regional Medical Center).

2014 Hospital Internal Mammary Artery (IMA) Usage Findings

The IMA is the preferred conduit for CABG surgery of the left anterior descending (LAD) artery. Hospitals with high rates of IMA usage are adhering to nationally recognized best practices in heart bypass surgery. There is no consensus on an optimal usage rate, so “Better” performance ratings are not given. The average IMA usage rate among California hospitals was 97.1 percent in 2014, 96.6 percent in 2013, and 89.6 percent in 2003.

- Three of 127 California hospitals (Antelope Valley Hospital, Palmdale Regional Medical Center, and Shasta Regional Medical Center) were rated “Low” with IMA usage rates significantly lower than the state average. All of these hospitals have had low IMA usage rates historically: Palmdale Regional Medical Center was rated “Low” in 2013 and 2014. Antelope Valley Hospital was rated “Low” from 2008 to 2010 and 2012 to 2014. Shasta Regional Medical Center was rated “Low” in 2009, 2010, and from 2012 to 2014. Sutter Medical Center of Santa Rosa improved their utilization and, for the first time, were not rated “Low.”

2013-2014 Surgeon Operative Mortality Findings

The statewide operative mortality rate was 2.13 percent (512 deaths after 24,092 procedures) for the 271 surgeons who performed isolated CABG surgery in 2013-2014. This is a small increase from 2.06 percent in 2011-2012.

- Overall, no surgeons performed “Better” than the state average operative mortality rate.
- Overall, seven surgeons performed “Worse” than the state average operative mortality rate (Drs. Eli R. Capouya, Philip A. Faraci, Michael P. Koumjian, Alexander R. Marmureanu, Yousef M. Odeh, Daniel P. Pelligrini, and John M. Robertson).

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5 CCORP provided each hospital with a preliminary report containing the risk-adjusted models, explanatory materials, and results for all hospitals. Hospitals were given a 60-day review period to submit statements to CCORP for inclusion in this report.

† A statement from Sharp Memorial Hospital is available at: http://www.oshpd.ca.gov/HID/CABG-Report.html

6 The increase in the statewide IMA usage rate over the last 10 years is partly due to a change in the IMA measure. Beginning in 2008, patients who did not have the left anterior descending artery bypassed were excluded from the denominator.
For detailed results by hospital, please see *California Hospital Performance Ratings for Coronary Artery Bypass Graft (CABG) Surgery by Region, 2014*. For detailed results by surgeon name, please see *California Surgeon Performance Ratings for Coronary Artery Bypass Graft (CABG) Surgery, 2013-2014*. For information on research methods and statistical results, please see the *Technical Note for the California Report on Coronary Artery Bypass Graft Surgery 2013-2014: Hospital and Surgeon Data*. [http://www.oshpd.ca.gov/HID/CABG-Report.html](http://www.oshpd.ca.gov/HID/CABG-Report.html)

Risk-adjusted readmission rates for 2014 are not included in this report, instead 2014 will be combined with 2015 results in the next public report. Future readmission results will continue to combine two years of data to improve the stability of the risk-adjusted rates.