THE DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION

The California Report on Coronary Artery Bypass Graft (CABG) Surgery 2024: Hospital Data

Overview

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 20 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 the appropriateness of CABG surgery by informing consumers, hospitals, surgeons, and others about the performance of hospitals.

The *California Report on Coronary Artery Bypass Graft (CABG) Surgery 2024: Hospital Data* provides quality ratings for the 120 California-licensed hospitals performing adult isolated CABG[1] during 2024 or CABG + Valve[2] surgery during 2023 and 2024. Hospital results for isolated CABG operative mortality and internal mammary artery (IMA)[3] utilization are based on calendar year 2024 data. Hospital results for CABG + Valve operative mortality, isolated CABG post-operative stroke, and isolated CABG 30-day readmission are based on combined 2023-2024 calendar year data to increase statistical reliability.

The outcome measures are risk-adjusted, a process that takes into account patients' pre-existing health conditions to allow for fair comparisons among hospitals.

- *Isolated CABG operative mortality* includes all deaths that occurred during the hospitalization, up to 90 days, in which the CABG surgery was performed, or all deaths after transfer to another acute care center up to 90 days and/or 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.

[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 (salvage) 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.

- *Hospital readmission* includes all-cause unplanned readmissions that arise from acute clinical events requiring urgent rehospitalization within 30 days of being discharged alive following isolated CABG surgeries. This definition was revised starting with 2017-2018 data. Readers should exercise caution when comparing readmission rates in this report to those in previous years.

Also included in this report are the IMA utilization rates 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]

The California Cardiovascular Outcomes Reporting Program (CCORP) provided each hospital with a preliminary report containing 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. No hospitals chose to submit statements for this report.

Hospital Operative Mortality Findings

2024 Isolated CABG Operative Mortality

The operative mortality rate for isolated CABG surgery in California was 2.2 percent (288 deaths after 12,949 procedures) in 2024. This rate was slightly higher than the rate reported for 2023 (2.0 percent). Overall, the 2024 rate represents a 24.1 percent reduction since 2003 (2.9 percent), the first year of mandated public reporting.

- After adjusting for patients' pre-operative health conditions, 95.8 percent of all hospitals performed within the statistically acceptable range of the state average. One hospital was rated "**Better**" than the state average operative mortality rate (Loma Linda University Medical Center).

- After adjusting for patients' pre-operative health conditions, four hospitals were rated "**Worse**" than the state average operative mortality rate (Adventist Health Bakersfield, Bakersfield Memorial Hospital, Providence St. Joseph Hospital,[5] and St. Joseph's Medical Center of Stockton).

[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.
[5] Refers to Providence St. Joseph Hospital in Orange County.

2023-2024 CABG + Valve Operative Mortality

The operative mortality rate for CABG + Valve surgery in California was 4.9 percent in 2023-2024 (174 deaths after 3,573 procedures). This rate was lower than the one from 2022-2023 (5.4 percent).

- After adjusting for patients' pre-operative health conditions, 99.1 percent of all hospitals performed within the statistically acceptable range of the state average. There was one hospital rated "**Better**" than the state average operative mortality rate (Kaiser Foundation Hospital - Santa Clara).

- After adjusting for patients' pre-operative health conditions, there was no hospital rated "**Worse**" than the state average operative mortality rate.

2023-2024 Hospital Post-Operative Stroke Findings

The post-operative stroke rate for isolated CABG surgery in California was 1.3 percent (347 strokes after 25,992 procedures) in 2023-2024. This rate was lower than the rate reported for 2022-2023 (1.4 percent).

- After adjusting for patients' pre-operative health conditions, 94.2 percent of all hospitals performed within the statistically acceptable range of the state average. One hospital was rated **"Better"** than the state average post-operative stroke rate (Hoag Memorial Hospital Presbyterian).

- After adjusting for patients' pre-operative health conditions, six hospitals were rated **"Worse"** than the state average post-operative stroke rate (Bakersfield Memorial Hospital, Good Samaritan Hospital - San Jose, Memorialcare Saddleback Medical Center, Providence Cedars-Sinai Tarzana Medical Center, Torrance Memorial Medical Center, and USC Arcadia Hospital).

2023-2024 Hospital Readmission Findings

The statewide hospital all-cause unplanned 30-day readmission rate was 11.0 percent (2,305 readmissions out of 20,992 patient discharges) for those who underwent isolated CABG surgery in 2023-2024, were discharged alive, and could be followed-up via hospital patient discharge data. This rate was lower than the rate reported for 2022-2023 (11.2 percent).

- After adjusting for patients' pre-operative health conditions, 84.9 percent of all hospitals performed within the statistically acceptable range of the state average. Nine hospitals were rated "**Better**" than the state average readmission rate (Hoag Memorial Hospital Presbyterian, John Muir Medical Center - Concord Campus, Kaiser Foundation Hospital - Fontana, Kaiser Foundation Hospital - Los Angeles, Kaiser Foundation Hospital - San Francisco, Kaiser Foundation Hospital - Santa Clara, Mercy General Hospital, Stanford Health Care, and UC San Diego Health La Jolla - Jacobs Medical Center & Sulpizio Cardiovascular Center).

- After adjusting for patients' pre-operative health conditions, nine hospitals were rated "**Worse**" than the state average readmission rate (Centinela Hospital Medical Center, Community Regional Medical Center - Fresno, Doctors Medical Center, Garfield Medical Center, Los Robles Hospital and Medical Center, Northridge Hospital Medical Center, Scripps Memorial Hospital - La Jolla, St. Mary Medical Center - Long Beach, and Torrance Memorial Medical Center).

2024 Hospital Internal Mammary Artery (IMA) Usage Findings

The IMA is the preferred conduit for CABG surgery of the left anterior descending artery. Hospitals with *high* rates of IMA usage are adhering to the nationally recognized best practices in heart bypass surgery by utilizing the IMA procedure. However, because there are certain patient conditions where IMA usage may not be appropriate, there is no consensus on what constitutes an optimal usage rate. Therefore, performance ratings are not provided in the HCAI report. The IMA average usage rate for all hospitals was 99.3 percent in 2024, 99.3 percent in 2023, and 89.6 percent in 2003.

For information on research methods and statistical results, please see the *Technical Note for the California Report on Coronary Artery Bypass Graft Surgery 2024: Hospital Data*. https://data.chhs.ca.gov/dataset/california-hospital-performance-ratings-for-coronary-artery-bypass-graft-cabg-surgery