

## EXECUTIVE SUMMARY

The California Coronary Artery Bypass Graft (CABG) Outcomes Reporting Program is the largest public reporting program on CABG surgery outcomes in the United States.

The *California Report on Coronary Artery Bypass Graft Surgery, 2007 Hospital Data* presents findings from analyses of data collected from California's 121 state-licensed hospitals that performed adult isolated coronary artery bypass graft surgery<sup>1</sup> during 2007.

The report uses 2007 risk-adjusted operative mortality data and 2006 and 2007 risk-adjusted post-operative stroke data to evaluate hospital performance. Risk adjustment is a statistical technique that allows for fair comparison of hospital outcomes even though some hospitals have sicker patients than average. Operative mortality includes all deaths that occur during the hospitalization in which the CABG surgery was performed (regardless of length of stay) and any deaths within 30 days after the surgery, no matter where they occur. Post-operative stroke is defined as a central neurologic deficit persisting for more than 72 hours in the operating hospital after surgery.

Hospital post-operative stroke rates appear as a new measure of CABG quality in this report for the first time based on a recommendation made by the California CABG Outcomes Reporting Program's Clinical Advisory Panel.

This report also provides hospital-level information on internal mammary artery (IMA)<sup>2</sup> usage for 2007, an additional measure of surgical quality, and examines the relationship between the number of surgeries that hospitals perform and their mortality rates.

### Key findings from this report are:

#### 2007 Mortality Findings:

- There were 347 operative deaths among 14,756 isolated CABG surgeries.
- The operative mortality rate for isolated CABG surgery in California was 2.35%, compared to 2.2% for 2006. The rates for 2005, 2004, and 2003 were 3.1%, 3.3%, and 2.9% respectively. Although the rate is up slightly from 2006, there has been a 19% reduction in the rate since 2003, the first year of mandated public reporting.

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<sup>1</sup> 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. For a complete definition of isolated CABG, see [http://www.oshpd.ca.gov/HID/SubmitData/CCORP\\_CABG/2006AbstractTrain.pdf](http://www.oshpd.ca.gov/HID/SubmitData/CCORP_CABG/2006AbstractTrain.pdf).

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

- There was significant variation, from 0% to 17.7%, in hospital operative mortality rates after adjusting for patients' pre-operative health. Despite such variation, 117 of 121 hospitals (96.7%) performed at a rate that did not differ significantly from the statewide average.
- No hospital performed significantly "Better" than the state average in terms of risk-adjusted operative mortality, but four hospitals performed significantly "Worse" than the state average (shown in the following table alphabetically):

<b>Hospitals with "Worse" Performance Ratings Based on Risk-adjusted Operative Mortality Rates, 2007</b>	
<b>Hospital</b>	<b>Region</b>
Enloe Medical Center	Sacramento Valley & Northern California Region
Los Angeles Co. Harbor - UCLA Medical Center	Greater Los Angeles
St. Joseph's Medical Center of Stockton	Central California
Valley Presbyterian Hospital	San Fernando Valley, Antelope Valley, Ventura & Santa Barbara

2006-2007 Stroke Findings:

- 405 of the 30,379 patients (1.33%) who underwent isolated CABG surgery experienced a post-operative stroke, similar to the national rate of 1.4% reported by the Society of Thoracic Surgeons.<sup>3</sup>
- There is wide variation in post-operative stroke rates among hospitals after adjusting for patients' pre-operative conditions. Hospital risk-adjusted post-operative stroke rates ranged from 0% to 5.6%, and 115 of 121 hospitals (95%) performed at a rate that did not differ significantly from the statewide average.
- One hospital performed significantly "Better" than the state average on post-operative stroke, and five hospitals performed significantly "Worse" than the state average (shown in the following table alphabetically):

<sup>3</sup> 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* 2009; 88:S2-22.

<b>Hospitals with “Better” Performance Ratings Based on Risk-adjusted Post-operative Stroke Rates, 2006-2007</b>	
<b>Hospital</b>	<b>Region</b>
Alta Bates Summit Medical Center - Summit Campus	San Francisco Bay Area & San Jose
<b>Hospitals with “Worse” Performance Ratings Based on Risk-adjusted Post-operative Stroke Rates, 2006-2007</b>	
<b>Hospital</b>	<b>Region</b>
Los Angeles Co. Harbor - UCLA Medical Center	Greater Los Angeles
Memorial Medical Center of Modesto	Central California
Sharp Memorial Hospital	Greater San Diego
Sutter Memorial Hospital	Sacramento Valley & Northern California Region
Tri-City Medical Center	Greater San Diego

2007 Internal Mammary Artery Usage Findings:

- California had a 93.7% IMA usage rate in 2007, a 4% increase and improvement since 2003.
- Five California hospitals (listed in the following table alphabetically) had lower than average IMA performance ratings:

<b>Hospitals with “Low” Performance Ratings for IMA Usage, 2007</b>	
<b>Hospital</b>	<b>Region</b>
Citrus Valley Medical Center - IC Campus	Greater Los Angeles
Dameron Hospital	Central California
Lakewood Regional Medical Center	Greater Los Angeles
Sutter Medical Center of Santa Rosa	San Francisco Bay Area & San Jose
Tri-City Medical Center	Greater San Diego

*Effect of Hospital Volume on CABG Outcomes*

- A small, but significant association was found between hospitals' isolated CABG surgery volume and their risk-adjusted operative mortality rates.
- No significant association was found between hospitals' CABG surgery volume (either isolated or total CABG surgery) and their risk-adjusted post-operative stroke rates.

*Percutaneous Coronary Intervention vs. CABG Utilization and Outcomes Findings*

- In California, utilization of percutaneous coronary interventions (PCIs) such as angioplasty with stent insertion increased by 20% from 1997 to 2008, peaking in 2005 when total PCI volume reached 60,709. During the same period, the number of isolated CABG surgeries dropped by 50%. The observed in-hospital mortality rate for isolated CABG surgeries decreased from 3.1% in 1997 to 1.9% in 2008 while the in-hospital mortality rate for PCIs increased slightly from 1.7% in 1997 1.8% in 2008.