



Small Numbers Can Have Big Consequences: Many California Hospitals Perform Dangerously Low Numbers of Cancer Surgeries

Most California hospitals perform a dangerously low number of surgeries for one or more of 11 cancers for which there is strong research linking low hospital surgery volume and increased risk of mortality and complications.¹ Complications associated with low volume include postoperative complications, longer hospital stays, cancer recurrence, other adverse outcomes after discharge, and higher readmission rates. In 2015 the California Health Care Foundation published a report, *Safety in Numbers: Cancer Surgeries in California Hospitals*. This issue brief repeats the report's analysis of volume of surgeries for 11 cancers at California hospitals using more recent data² and finds that, unfortunately, the problem of low hospital volume of surgeries for these cancers persists.

Despite the evidence base associating low volume with poor outcomes, this analysis reveals that 72% of California hospitals performed only one or two surgeries for one or more of these 11 cancers; the analysis also found that nearly three-quarters of the patients who underwent surgery for one of these cancers at a hospital that performed only one or two surgeries for that cancer could have reached

a hospital in the top quintile for volume within 50 miles of their home.³ A hospital-by-hospital analysis of volume of cancer surgeries for these 11 cancers can now be found online.⁴

This issue brief also includes a new analysis of California hospitals, applying a standard developed by the Dartmouth-Hitchcock Medical Center, the Johns Hopkins Hospital and Health System, and the University of Michigan Health System. It is hoped that the information in this issue brief will support California health care providers, health care payers, and consumers in decisionmaking that leads to fewer cases where surgeries are performed in low-volume settings, thereby increasing safety and better health outcomes in California, where the American Cancer Society estimates that 173,000 patients were newly diagnosed with cancer in 2016 alone.

Analysis

Applying the Dartmouth/Johns Hopkins minimum standards. In an attempt to address the dangers associated with low-volume cancer surgeries, in 2015 three nationally renowned health systems — the Dartmouth-Hitchcock Medical Center, the Johns Hopkins Hospital and Health System, and the University of Michigan Health System — came together to set minimum annual volume standards for four types of cancer surgeries at their hospitals.⁵ The following analysis applies the Dartmouth/Johns Hopkins minimum standards to California hospitals and finds that during the one-year period analyzed here, 3,719 cancer surgeries were performed at California hospitals that fell below that minimum standard for that type of cancer. Table 1 shows a breakdown of surgeries for four cancers at California hospitals.

Higher volume within reach for many patients. Many of the patients who underwent surgery at a hospital that did not meet the Dartmouth/Johns Hopkins minimum standard could have reached a hospital meeting the volume standard within 50 miles of their home zip code, as shown in Table 2.

Applying the most conservative standard. Using an exceptionally conservative definition of “low volume,” this analysis found that 241 California hospitals performed only one or two surgeries annually for at least one of the 11 cancers for which there is evidence that low volume is associated with poor outcomes. Table 3 provides some additional data on hospitals that performed only one or two surgeries for a particular type of cancer. During this one-year period, 630 cancer surgeries were performed at

Table 1. Dartmouth/Johns Hopkins Minimum Standards Applied to California Hospitals for Four Cancer Surgeries

	DARTMOUTH/JOHNS HOPKINS MINIMUM STANDARD	AT HOSPITALS THAT DID NOT MEET THE MINIMUM STANDARD		
	Surgeries Per Year	Number of Hospitals	Number of Surgeries Performed	Percentage of All Such Surgeries Performed
Esophagus	20	78	307	86%
Lung	40	171	2,066	62%
Pancreas	20	89	411	47%
Rectum	15	197	935	41%

Table 2. Of Patients Who Had Cancer Surgery at Hospitals That Did Not Meet the Dartmouth/Johns Hopkins Minimum Standards, the Percentage Who Could Have Reached a Hospital That Did Meet the Standard

	TOP QUINTILE HOSPITAL WITHIN 20 MILES	TOP QUINTILE HOSPITAL WITHIN 50 MILES
Esophagus	9%	36%
Lung	48%	74%
Pancreas	41%	68%
Rectum	51%	75%

California hospitals that did only one or two surgeries for that type of cancer. (See page 3.)

The incidence of hospitals performing low volumes of surgeries has been relatively constant over the last few years. In 2013, 71% of California hospitals performed only one or two surgeries for one or more of these 11 cancers; in 2014, 73%; and in 2015, 72%.

Hospitals that performed only one or two surgeries for at least one of the 11 cancers were found among small, medium, and large hospitals, among both teaching and nonteaching hospitals, and among both rural and urban hospitals. Taking into account

the number of urban and rural hospitals in California, the rate at which these low-volume surgeries happen at urban hospitals is slightly higher than the rate for rural hospitals.

Higher volume within reach for many patients of one- or two-procedure hospitals. Nearly half (47%) of patients who had surgeries at hospitals that performed only one or two surgeries for the cancer they had could have reached a hospital that performed in the top quintile for volume within 20 miles; 74% of these patients could have reached such a hospital within 50 miles.

Table 3. Surgeries at California Hospitals That Performed Only One or Two Surgeries in a Year for a Particular Type of Cancer

	AT HOSPITALS PERFORMING 1-2 SURGERIES FOR THIS TYPE OF CANCER		
	Number of Hospitals	Number of Surgeries Performed	Percentage of All Such Surgeries Performed
Bladder	57	77	8%
Brain	21	30	1%
Breast	19	28	0.1%
Colon	25	33	0.5%
Esophagus	45	59	16%
Liver	39	50	4%
Lung	30	44	1.3%
Pancreas	38	48	5%
Prostate	28	34	0.6%
Rectum	79	109	5%
Stomach	88	118	12%

Recommendations

- ▶ Health care providers should cease performing low volumes of surgeries for these cancers for which there is strong evidence of an association between low volume and poor outcomes. The exception would be in truly rare emergency circumstances, where it could be preferable for the patient to have the surgery performed in a low-volume hospital than to not have the surgery at all.
- ▶ Payers should put providers on notice that they will cease paying for low-volume surgeries for these cancers for which there is a known link between the volume of surgeries performed and outcomes.
- ▶ Health care organizations (for example, cancer specialty societies) and policymakers should provide guidance to providers regarding the appropriate volume of cancer surgeries.
- ▶ Providers, payers, and policymakers should work to make patients aware of hospital volume data and should encourage them to use these data in making decisions about where to have their surgeries performed.

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Endnotes

1. In October 2015, the California Health Care Foundation published *Safety in Numbers: Cancer Surgeries in California Hospitals*, which highlights a cancer surgery hospital volume analysis of California OSHPD discharge data for 2014. The 17-page report expands on many of the issues raised in this issue brief. See page 4 and Appendix A, page 11 for a description of the literature review findings regarding the association between low volume and poor outcomes mentioned in this issue brief.
2. This analysis is based on patient discharge data obtained from the California OSHPD for the 4th quarter of 2014 through the 3rd quarter of 2015; this time period was chosen because it was the most recent one-year period for which data based on consistent ICD-9 codes were available.
3. The analysis used to produce this issue brief follows the methodology described in the November 2015 California Health Care Foundation report, *Safety in Numbers: Cancer Surgeries in California Hospitals*; see Appendix A, page 11.
4. Hospital-specific data showing volume of cancer surgeries for the 11 cancers discussed in this issue brief can be found at www.oshpd.ca.gov and at calhospitalcompare.org.
5. “Hospitals Move to Limit Low-Volume Surgeries,” *U.S. News & World Report*, May 19, 2015; email correspondence between John D Berkemeyer, MD, of Dartmouth-Hitchcock Medical Center and Maryann O’Sullivan, May 31, 2015.