

# Breast Cancer Surgical Outcomes by Treatment Settings: Inpatient vs. Ambulatory Surgery Centers

Lihua Liu, PhD,<sup>1,2</sup> Juanjuan Zhang, MS<sup>1</sup> Kathy Wojcik, PhD<sup>1</sup> Irene Kang, MD<sup>2</sup>

1. Los Angeles Cancer Surveillance Program, Keck School of Medicine, University of Southern California, Los Angeles, USA
2. Norris Comprehensive Cancer Center, Keck School of Medicine, University of Southern California, Los Angeles, USA

**Background:**

- Breast cancer is generally treated with surgery.
- Ambulatory surgery centers (ASCs) have grown in number and popularity in response to demand for high-quality, cost-effective alternatives to inpatient hospital care for surgical services.
- Increasing volumes of breast cancer surgeries now happen in ASCs with well-established safety and quality standards, cost savings, as well as patient satisfaction.
- Yet, there has been a lack of population-based assessments of survival differences among breast cancer patients following surgical treatment in ASCs as compared to inpatient settings.

**Methods:**

- California Cancer Registry (CCR) data linked with the California Office of Statewide Health Planning and Development (OSHPD) records during 2005-2019 diagnostic year were used.
- We identified 191,543 adult women (>=18 years of age) diagnosed with first primary breast cancer with known disease stage from the CCR, who also had first breast cancer related surgery records within the period of 2 months before and 12 months after the cancer diagnosis according to the OSHPD records.
- Five-year observed survival by cancer stage (localized, regional, or distant), surgery type (lumpectomy or mastectomy), and surgery setting (inpatient or ASC) was calculated.
- Cox proportional hazard ratios (HR) of death probabilities were calculated by surgery setting, stratified by surgery type, while controlling for confounders (age at diagnosis, race/ethnicity, socioeconomic status, stage).

**Table 1.** Breast Cancer Surgery Distributions by Cancer Stage, Surgery Type, Surgery Setting, and Corresponding 5-Year Observed Survival

Summary Stage (N=191,543)	Surgery Type (%)	Surgery Setting (%)	5-year survival	95% Confidence Interval		
Localized n=128,432 (67%)	Lumpectomy 76%	Inpatient ASC 4% 96%	87.9% 92.8%	86.9% 92.6%	88.9% 93.0%	
	Mastectomy 24%	Inpatient ASC 55% 45%	90.1% 90.2%	89.6% 89.6%	90.6% 90.8%	
Regional n=59,551 (31%)	Lumpectomy 50%	Inpatient ASC 11% 89%	81.9% 87.8%	80.5% 87.3%	83.2% 88.2%	
	Mastectomy 50%	Inpatient ASC 60% 40%	77.6% 80.4%	77.0% 79.5%	78.2% 81.2%	
Distant n=3,560 (2%)	Lumpectomy 36%	Inpatient ASC 20% 80%	37.0% 51.7%	31.0% 48.4%	43.0% 55.0%	
	Mastectomy 64%	Inpatient ASC 64% 36%	40.8% 49.3%	38.3% 45.4%	43.3% 53.3%	

**Results:** The stage distributions of the 191,543 patients were 67% localized, 31% regional, and 2% distant (Table 1). The proportion of lumpectomy among localized patients was 76%, regional 50%, and distant 36%. The proportion of surgery done in ASCs, as compared to inpatients, was 96% among the localized-lumpectomy patients, 89% regional-lumpectomy, 80% distant-lumpectomy. Use of ASCs is substantially lower among mastectomy patients across stage. The 5-year survival is consistently higher for ACSs than inpatients regardless of stage and surgery type. According to the multivariable HR, survival for ASC group is 28% better than the inpatient group for lumpectomy and 13% better for mastectomy group (both p<0.0001) (Table 2)

**Table 2.** Multivariate Hazard Analysis of Death Probability by Surgery Type and Surgery Setting

Surgery Type		Lumpectomy				Mastectomy			
Characteristics		Hazard Ratio		Pr > ChiSq		95% Hazard Limits		Hazard Ratio	
Age Group	18-49	1 <sup>ref</sup>						1 <sup>ref</sup>	
	50-69	1.42	<.0001			1.35	1.49	1.369	<.0001
	70+	5.47	<.0001			5.22	5.73	4.357	<.0001
Race/Ethnicity	NH white	1 <sup>ref</sup>						1 <sup>ref</sup>	
	NH black	1.34	<.0001			1.28	1.41	1.312	<.0001
	Hispanic	0.90	<.0001			0.86	0.93	0.897	<.0001
	API	0.74	<.0001			0.70	0.78	0.759	<.0001
	Other	1.09	0.399			0.90	1.31	1.217	0.0629
								0.99	1.5
Socioeconomic Status	Low	1 <sup>ref</sup>						1 <sup>ref</sup>	
	Middle	0.87	<.0001			0.84	0.90	0.847	<.0001
	High	0.71	<.0001			0.69	0.74	0.706	<.0001
Summary Stage	Localized	1 <sup>ref</sup>						1 <sup>ref</sup>	
	Regional	1.70	<.0001			1.65	1.75	2.14	<.0001
	Remote	8.08	<.0001			7.51	8.68	7.17	<.0001
Surgery setting	Inpatient	1 <sup>ref</sup>						1 <sup>ref</sup>	
	ASC	0.72	<.0001			0.69	0.75	0.87	<.0001

**Conclusion:** The wide use and better survival associated with ASCs are reassuring and have a lot of implications for cancer care as well as surveillance case-finding.

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