

## Background

The surgical management of breast cancer patients has steadily evolved, with evidence indicating the safety and aesthetic superiority of nipple sparing mastectomy (NSM) for select patient populations. Despite known benefits of NSM, certain patient subgroups face disparate rates of treatment and few studies investigate this inequality. The objective of this study was to examine factors from four levels – patient, disease, provider, and system – associated with inequitable distribution of NSM.

## Methods

Breast cancer patients across 8 hospitals in a single healthcare system from 2014 to 2018 were retrospectively reviewed. Patients were categorized by mastectomy type – NSM or other mastectomy (OM). Demographic information, disease characteristics, provider descriptions, and systems level variables were obtained. Bivariate analysis was used to identify variables for inclusion in the backward multivariate model. A total population of 1,202 patients was identified and included for analysis.

## Results

Characteristic	N (%) or mean (SD)	95% Wald Confidence Limit	
Age	55.8 (±13.5)	<b>0.950</b>	<b>0.986</b>
Income			
<\$75,000	418 (34.8%)	Reference	
\$75,000-\$125,000	613 (51.0%)	<b>0.337</b>	<b>0.953</b>
>\$125,000	171 (14.2%)	0.332	1.302
Cancer stage			
0	185 (15.4%)	0.514	1.641
1	362 (30.1%)	Reference	
2	375 (31.2%)	0.392	1.096
3	180 (15.0%)	<b>0.108</b>	<b>0.469</b>
4	21 (1.7%)	<0.001	>100.00
Prophylactic	79 (6.6%)	0.485	2.968
Mastectomy weight	692.5 (±491.4)	<b>0.994</b>	<b>0.996</b>

**Table 1a and 1b:** For every year increase in age, the odds of NSM decrease by 3%. The odds of NSM decrease by 43% for patients with income of \$75,000-12,5000 compared to <\$75000. The odds of NSM decrease 1% for every unit increase in mastectomy weight. Reconstructive technique was related to different odds of NSM, with odds being 2.1 times higher for tissue expander and 8.3 times higher for implants compared to free flap. Specific surgeons also had differing odds of NSM with results displayed for the 6 surgeons with the most operations compared to a reference group of surgeons performing less than 5% of mastectomies as individuals.

Characteristic	N (%) or mean (SD)	95% Wald Confidence Limit	
Recon technique			
None	328 (27.3%)	<b>0.024</b>	<b>0.250</b>
Free flap	135 (11.2%)	Reference	
Latissimus flap	26 (2.2%)	0.538	6.677
TE	497 (41.3%)	<b>1.083</b>	<b>4.167</b>
DTI	195 (16.2%)	<b>3.626</b>	<b>18.834</b>
Other	23 (1.9%)	<b>2.535</b>	<b>28.189</b>
Surgeon			
1	263 (21.9%)	0.796	3.039
2	222 (18.5%)	0.586	2.318
3	122 (10.2%)	0.286	1.311
4	100 (8.3%)	<b>0.079</b>	<b>0.717</b>
5	80 (6.7%)	<b>1.601</b>	<b>24.741</b>
6	148 (12.3%)	<b>0.048</b>	<b>0.318</b>
Other	267 (22.2%)	Reference	

## Discussion

This study highlights disparities in receipt of NSM from multiple levels of influence – patient, disease, provider, and systemic – within our diverse health system. While several factors contribute to delivery of NSM, patient characteristics and provider tendencies appear to increase the odds of undergoing NSM. This relationship indicates a strong tie between mastectomy choice and human driven factors.

By identifying factors related to inequitable delivery of NSM, we can work to develop interventions so that all patients receive the highest quality care. Investigations should be designed to evaluate intervention strategies aimed at providing a more equitable distribution of the NSM technique

## References

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3. Sisco M, Yao KA. Nipple-Sparing Mastectomy: A Contemporary Perspective. *Journal of Surgical Oncology*. 2016;113:883-890.