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## Utilization of Mastectomy and Reconstruction in the Outpatient Setting

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### Abstract

**Background**—Reconstruction rates after mastectomy have been reported to range from 25–40 %; however, most studies have focused on patients treated in an inpatient setting. We sought to determine the utilization of outpatient mastectomy and use of breast reconstruction in Southern California.

**Methods**—Postmastectomy reconstruction rates were determined from the California Office of Statewide Health Planning and Development database from 2006–2009 using CPT codes and similarly from an inpatient database using ICD-9 codes. Reconstruction rates were compared between the inpatient and outpatient setting. For the outpatient setting, univariate and multivariate odds ratios with 95 % confidence intervals were estimated for relative odds of immediate reconstruction versus mastectomy alone.

**Results**—The percentage of patients undergoing outpatient mastectomy ranged from 20.4 to 23.9 % of the total number of all patients undergoing mastectomy. Whereas immediate inpatient reconstruction increased from 29.2 to 41.6 % (overall rate 35.5 %), the proportion of outpatients undergoing reconstruction only increased from 7.7 to 10.3 % (overall rate 9.1 %). Similar to the inpatient setting, in multivariate analysis, age, insurance status, race/ethnicity, and type of hospital were significantly associated with the use of reconstruction in the outpatient setting.

**Conclusions**—A substantial number of patients undergo outpatient mastectomy with low rates of reconstruction. Although the choice of an outpatient mastectomy may certainly represent a selection bias for those not choosing reconstruction, an increase in the use of outpatient mastectomy may result in decreases in the use of post-mastectomy reconstruction.

A potential quality measure of breast cancer care is the use of reconstruction following mastectomy. The National Accreditation Program for Breast Centers currently requires that all appropriate patients who undergo mastectomy receive preoperative referrals to reconstructive/ plastic surgeons (NAPBC Standard 2.18). At the same time, there has been increasing pressure on surgeons and hospitals to perform mastectomy as an outpatient procedure, with rates steadily increasing since the 1990s.<sup>1–3</sup> These efforts may be in direct conflict with each other.

After mastectomy for breast cancer, fewer than half of patients undergo reconstruction despite recognized benefits, such as improved quality of life and overall well-being for those selecting this option.<sup>4–8</sup> Many studies have cited differences in postmastectomy

reconstruction rates based on multiple variables with rates ranging from 25 to 40 %;<sup>9–15</sup> however, most of these studies have focused on patients treated in an inpatient setting. For the outpatient setting, most studies have focused on the utilization of mastectomy alone without examining reconstruction rates. Our study had a twofold purpose: to determine the current rates of outpatient mastectomy for patients with breast cancer and to assess utilization of immediate breast reconstruction after mastectomy in the outpatient setting in Southern California.

## METHODS

### Patient Population

We selected patients with newly diagnosed breast cancer, either invasive carcinoma or ductal carcinoma in situ (DCIS), who underwent mastectomy and/or reconstruction between January 1, 2006 and December 31, 2009 in four Southern California counties (Los Angeles, Orange, San Bernardino, and Riverside) identified through the California Office of Statewide Health Planning and Development (OSHPD). As described previously, OSHPD releases an annual dataset providing information on patient demographics, hospital type, admitting diagnosis, inpatient procedures, length of stay, and type of insurance based on inpatient discharge records.<sup>9,10</sup> Starting in 2005, OSHPD began releasing Ambulatory Surgery datasets with similar data items included in the inpatient dataset. To protect patient anonymity, OSHPD releases only de-identified data and masks one or more demographic variables.

International Classification of Diseases 9th Revision (ICD-9) diagnosis codes were first used to identify female breast cancer patients with invasive disease (174.0–174.9) and with DCIS (233.0). For this study, both invasive and DCIS cancers were considered as a single group due to small numbers of DCIS mastectomy cases in the outpatient setting. For procedures performed in the outpatient setting, patients were classified using Current Procedural Terminology (CPT-4) codes for mastectomy and/or reconstruction (Table 1). In brief, simple mastectomy, radical mastectomy, and subcutaneous mastectomy were considered as a single group. For inpatient procedures, ICD-9 procedure codes were used to classify patients (Table 1). The current analysis is focused on immediate reconstruction because of the inability to track delayed reconstruction in the ambulatory setting. We evaluated the use of inpatient and outpatient implant reconstruction, whereas autologous flap reconstruction was investigated only in the inpatient setting since this procedure is currently not performed in the ambulatory setting. For both the outpatient and inpatient settings, patients with both a mastectomy procedure and a reconstruction procedure were classified as having immediate reconstruction. Because OSHPD data are de-identified and not linked across hospital visits or admissions, we assumed that any patient who underwent a mastectomy or reconstruction procedure in either setting was a unique individual.

Mastectomy rates as well as immediate reconstruction rates were compared between inpatient and outpatient settings. For the outpatient setting, univariate and multivariate odds ratios (OR) with 95 % confidence intervals (CI) were calculated using logistic regression to estimate the relative odds of immediate reconstruction versus mastectomy only by factors, including calendar year of surgery (2006, 2007, 2008, or 2009), age (<40 years, 40–59 years, 60 years or older and unknown age [masked data]), race/ ethnicity (non-Hispanic white, Hispanic white, African American, Asian, other, and unknown race [masked data]), type of insurance (Medicare, Medicaid, private, or other insurance), and type of hospital (National Cancer Institute designated Comprehensive Cancer Center [NCI-CCC], teaching hospital, or other type of hospital [not NCI-CCC or teaching hospital]). We conducted tests for trend by fitting ordinal values corresponding to categories of exposure. All statistical

analyses were performed using SAS version 9.2 (SAS Institute Inc., Cary, NC). We considered a two-sided *P* value <0.05 as statistically significant.

## RESULTS

During the 4-year period, a total of 4,395 breast cancer patients underwent outpatient mastectomy with 3,993 patients undergoing mastectomy alone and 402 undergoing mastectomy with immediate reconstruction (Table 2), whereas 15,192 breast cancer patients underwent inpatient mastectomy, with 9,799 patients undergoing mastectomy alone and 5,393 patients undergoing immediate reconstruction in the inpatient setting (data not shown). The percentage of mastectomies performed on an outpatient basis remained relatively stable during the 4-year period, ranging from 20.4 to 23.9 %. Whereas inpatient mastectomies with immediate reconstruction increased from 29.2 to 41.6 % from 2006 to 2009 (with an overall rate of 35.5 %), the proportion of outpatients undergoing immediate reconstruction rose to a much lesser degree, from 7.7 to 10.3 % (overall rate 9.1 %). Among the total number of patients with known age at surgery (*N* = 3,621) who underwent outpatient mastectomy during the defined time period, 4.5 % were younger than age 40 years, 46.1 % were between age 40–59 years, and 49.5 % were older than age 60 years. Among patients who underwent immediate outpatient reconstruction with known information on age (*N* = 319), 9.7 % were younger than age 40 years, 66.1 % were between age 40–59 years, and 24.1 % were older than age 60 years. Among patients undergoing outpatient mastectomy with known race/ethnicity (*N* = 2,717), 52.9 % were non-Hispanic white, 10.9 % were Hispanic white, 6.7 % were African American, and 11.6 % were Asian. Among patients who underwent immediate outpatient reconstructions with known race/ethnicity (*N* = 250), 62 % were non-Hispanic white, 10 % were Hispanic white, 4.4 % were African American, and 8.4 % were Asian. A total of 88.6 % of outpatient reconstruction procedures were performed in patients with private insurance compared with 6.2 % of patients with Medicaid and 4 % of patients with Medicare. The majority of outpatient mastectomies (91.2 %) and reconstructions (91.8 %) were performed at nonteaching hospitals and hospitals that were not designated cancer centers.

In multivariate analyses, age, race/ethnicity, insurance status, and type of hospital were significantly associated with the use of outpatient reconstruction (Table 3). No evidence for a statistically significant dose-response relationship between later calendar year and increased relative odds of undergoing immediate reconstruction was observed (*p* trend = 0.15). With increasing age the relative odds of undergoing immediate reconstruction decreased (*p* trend <0.001). Compared with non-Hispanic whites, African Americans were 58 % less likely to undergo immediate reconstruction (OR = 0.42, 95 % CI = 0.22–0.80), Asians were half as likely (OR = 0.52, 95 % CI = 0.32–0.85) and Hispanic whites were 39 % less likely (OR = 0.61, 95 % CI = 0.39–0.96). Patients with private insurance were nearly three times more likely to undergo an immediate reconstruction than patients with Medicaid (OR = 2.89, 95 % CI = 1.87–4.46). Patients undergoing treatment at NCI-CCCs were approximately half as likely (OR = 0.46, 95 % CI = 0.21–1.00) to undergo outpatient immediate reconstruction as patients treated at other facilities, whereas patients treated at teaching hospitals were 1.67 times more likely (OR = 1.67, 95 % CI = 1.06–2.63).

## DISCUSSION

There has been much interest in improving the low rate of reconstruction after mastectomy. Postmastectomy reconstruction has been proposed as an indicator of quality care for breast cancer patients and consideration of reconstruction is one of the required standards for nationally accredited breast centers. Legislatively, New York State mandates that doctors and hospitals provide information about the availability and insurance coverage for

reconstruction options to all breast cancer patients before their surgeries for breast cancer treatment.<sup>16</sup> The Women's Health and Cancer Rights Act of 1998 requires insurance companies to pay for reconstruction after mastectomy.<sup>17</sup> However, this law has not significantly affected reconstruction rates nor has it reduced the variability seen among geographic regions and patient subgroups.<sup>18</sup> The push to move toward outpatient mastectomy can be viewed as discordant with the efforts to provide reconstruction for all breast cancer patients undergoing mastectomies.

Many studies on outpatient mastectomy have focused on the Medicare population, aged 65 years and older. In this population, outpatient mastectomy has increased from 0 % in 1985 to 10.8 % in 1995 to 19.4 % in 2002.<sup>1,19</sup> These data may underestimate the actual proportion of patients in the general population who undergo this procedure, however. Data from The Healthcare Cost and Utilization Project (HCUP) for 1996 showed that 6.8 % of all mastectomies were ambulatory mastectomies with a range of 3–22 % depending on the state.<sup>3</sup> Although there was no association of age with the use of this procedure, for patients aged 50 years or younger, the percentage of outpatient mastectomies was 7 % of the total number of mastectomies performed. In Florida, Ferrante et al. also demonstrated an outpatient mastectomy rate of 20.1 % in 1994.<sup>2</sup> More contemporary data show an increase in this rate with an outpatient rate of nearly 22 % across all ages in 2003 (range 4–48 % across 17 states).<sup>20</sup> Our rates of 20.4–23.9 % are consistent with these reports.

Our study has examined the proportion of patients undergoing outpatient mastectomies among several age groups, whereas previous studies have focused on the group aged 65 years and older. In our data, the majority of patients who underwent an outpatient mastectomy fell into the 40–59 years age group (46.1 %). This age group had high postmastectomy inpatient reconstruction rates (35 % for invasive carcinoma and 57 % for DCIS) according to our previous work.<sup>9,10</sup> Even though patients treated in the outpatient setting between ages 40–59 years appear to have a high reconstruction rate (66.1 %), the overall reconstruction rate is low in the ambulatory setting (9.1 %). This implies that a significant number of patients who would otherwise have a high uptake of postmastectomy reconstruction are not undergoing this procedure; this is not accounted for in typical calculations of reconstruction rates after mastectomy.

Few studies to date have focused on the use of immediate reconstruction after mastectomy in the outpatient setting. Bian and colleagues demonstrated lower reconstruction rates in the outpatient setting (4 vs. 13 % inpatient) for 65- to 69-year-old patients in 1998–2002.<sup>21</sup> A broader study across all age group reported that the likelihood of having immediate reconstruction in the ambulatory setting was 10 % that of patients having inpatient procedures.<sup>3</sup> These are consistent with our results, which demonstrate that the immediate reconstruction rate was 9.1 % for those in the outpatient versus 35.5 % in the inpatient setting. Focusing purely on the outpatient setting, our postmastectomy reconstruction rates of 7.7–10.3 % are much higher than the reported rates of 2 and 4 % found in the prior studies, which likely reflects the later time period covered by our study.<sup>3,21</sup> Regardless, these percentages are far lower than what is generally considered to be the desired reconstruction rate.

During our study period, the use of immediate reconstruction in the inpatient setting steadily increased over the 4-year period; however the increase in the outpatient setting was neither consistent nor substantial. In this study, we demonstrated that younger age, non-Hispanic white race, private insurance, and undergoing surgery at a teaching hospital were significantly associated with the use of immediate reconstruction after mastectomy in the outpatient setting.

That younger age was predictive of outpatient reconstruction is consistent with prior findings that younger age is significantly associated with the use of immediate reconstruction in the inpatient setting.<sup>7,9-13,15,22-25</sup> Concern about appearance and cosmetic outcome may explain the increased rates of reconstruction in younger patients. Additionally, the increasing number of comorbidities associated with increasing age also might explain the decreased use of reconstruction in older age groups. Although our study did not examine comorbidities as a variable, other studies have shown that the presence of any comorbidity decreases the odds of outpatient mastectomy.<sup>1-3,19</sup> Because patients who undergo outpatient mastectomies should be relatively healthy compared with an inpatient cohort, one assumption is that comorbidity would be less of a factor limiting the use reconstruction in the outpatient setting.

Race and ethnicity were independently associated with the use of immediate reconstruction in the outpatient setting in our study, with lower rates in all minority groups. This recapitulates the data that we, as well as others, have previously shown in the inpatient setting.<sup>9-11,13,15,18,24</sup> Although the reasons behind the racial disparities seen in postmastectomy reconstruction are complex and multifactorial, our findings demonstrate that the disparities seen in the outpatient setting merit continued study of these issues.

Our study demonstrates the persistence of insurance status and type of hospital as predictive indicators of the use of reconstruction, with patients with private insurance almost three times more likely to undergo reconstruction as those with Medicaid insurance, despite the fact that both types of insurance are required to cover reconstruction. This is again consistent with previous work demonstrating this same relationship in the inpatient setting.<sup>9,10,12,14</sup> This may be multifactorial in origin, including issues of patient choice, barriers to access to specialists, and potentially even differential reimbursement rates. In contrast to prior work on the inpatient side, NCI-CCC patients were less likely to receive reconstruction in the outpatient setting. This may reflect the higher use of autologous flap reconstructions performed at NCI-CCCs (demonstrated in one of our prior studies), a procedure that cannot currently be performed in the outpatient setting.<sup>9</sup>

Although postmastectomy immediate reconstruction in the outpatient setting is not frequently utilized, it has shown to be feasible, with complication rates similar to those performed in the inpatient setting. In a study by Simpson et al., of 29 outpatient mastectomies with immediate reconstruction, only 1 (3 %) required a subsequent hospitalization for bleeding.<sup>26</sup> The overall complication rate was 24 % with three seromas, two cases of cellulitis, and one hematoma; most complications were managed in the outpatient office. This study's infection rate falls within reported infection rates (range 1-35 %) after inpatient postmastectomy reconstruction.<sup>27</sup> Infection after implantbased reconstruction has been shown to be associated with several factors, such as higher American Surgical Association (ASA) class, preoperative chemotherapy, and chest wall radiation,<sup>27-29</sup> all factors that not only may preclude a patient from having immediate reconstruction as an outpatient but also mastectomy as an outpatient. A metaanalysis evaluating surgical site infections (SSI) after breast surgery demonstrated that immediate reconstruction itself was not associated with higher rates of SSI.<sup>29</sup>

Another factor potentially limiting the utilization of immediate reconstruction after outpatient mastectomy is concerns about postoperative pain. With the advent of local anesthesia infusion catheters, postoperative pain associated with breast procedures has been shown to be significantly reduced. These portable devices allow for either continuous or bolus infusions of local anesthetics up to 48 h to surgical sites.<sup>30</sup> A large meta-analysis of 44 randomized control trials identified improved analgesia with the infusion catheters, reduced opioid use, decreased hospital stay, and increased patient satisfaction.<sup>31</sup> A large prospective

study ( $N = 687$ ) evaluated the use of infusion catheters after augmentation mammoplasty; the majority of patients were discharged home 3 h after surgery and 89 % reported reductions in pain the evening of surgery.<sup>32,33</sup> A study by Lu et al. demonstrated that patients undergoing reconstruction with tissue expanders had less postoperative pain in the recovery room ( $p < 0.01$ ) and reduced pain medication requirements ( $p < 0.01$ ) with infusion pumps compared with patients with conventional anesthesia.<sup>34</sup> Despite improving tools for postoperative pain relief that make the procedure technically feasible, concerns about the adequacy of pain control may continue to be a barrier for the use of outpatient immediate breast reconstruction.

This study has several potential limitations. Our data reflect the four counties in Southern California, limiting the study's generalizability. As previously discussed, there are geographic variations in the utilization of outpatient mastectomy: with women living in large metropolitan areas having higher rates of outpatient mastectomies and state-to-state variations as well.<sup>1,3,21</sup> Compiling all studies examining the use of outpatient mastectomy within the past decade, our range of 20.4–23.9 % falls within the range documented in other reports. Another limitation is that our study utilizes a large administrative database that relies on ICD-9 and CPT codes for patient identification, which can be imprecise for documentation of diagnoses and surgical procedures. It is unlikely that procedure codes would be systematically miscoded between outpatient and inpatient settings. Likewise, the use of OSHPD data, which represents a 100 % sample of the relevant area of study for this time period, increases the generalizability of these data. Finally, we cannot assess the appropriateness of the choice to forego reconstruction. It is certainly possible that patient choice represents a significant factor in patients' choosing reconstruction as well as the inpatient versus outpatient setting. It also should be noted that outpatient mastectomy may include patients who are not formally admitted to the hospital but may spend time in "extended recovery" or "observation" status, including physical overnight stays.

This study highlights the significant percentage of patients undergoing mastectomy as an outpatient procedure with low rates of reconstruction. Potential reasons for the low reconstruction rates in the ambulatory setting may be due to postoperative concerns, such as pain control for those being immediately discharged or technical issues in terms of the capability of outpatient-focused facilities. Most studies focusing on postmastectomy reconstruction rates have not taken into account the number of outpatient mastectomies being performed. Thus, many prior reports on postmastectomy reconstruction have underestimated the actual use of this important procedure as generally practiced. Disparities seen in the inpatient setting also occur in the outpatient setting and thus efforts to reduce these differences should also be incorporated in both milieus. Although we recognize that, currently, the choice of an outpatient mastectomy may represent a personal bias against reconstruction, the push toward outpatient mastectomy may result in decreases in the use of immediate postmastectomy reconstruction. It will be important to identify in future studies whether the increased use of outpatient mastectomy itself is a barrier to reconstruction after mastectomy by evaluating the role of patient choice. These current findings provide important information to health care policy makers that in the goal of containing health care costs we do not sacrifice quality care for breast cancer patients.

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TABLE 1

Breast procedure (mastectomy, implant reconstruction) ICD-9 to CPT mapping

<b>Patients treated at an inpatient facility</b>		<b>Patients treated at an outpatient facility</b>	
<b>ICD-9-CM</b>		<b>CPT (2006)</b>	<b>CPT ( 2007)</b>
85.33	Unilateral mastectomy with immediate breast prosthesis placement	19182 and 19340	19304 and 19340
85.34	Unilateral mastectomy without breast prosthesis placement	19182	19304
85.35	Bilateral mastectomy with immediate breast prosthesis placement	19182-50 and 19340-50	19304-50 and 19340-50
85.36	Bilateral subcutaneous mastectomy	19182-50	19304-50
85.41	Unilateral simple mastectomy	19180	19303
85.42	Bilateral simple mastectomy	19180-50	19303-50
85.43	Unilateral extended simple mastectomy	19240	19307
85.44	Bilateral extended simple mastectomy	19240-50	19307-50
85.45	Unilateral radical mastectomy	19220	19306
85.46	Bilateral radical mastectomy	19200-50	19305-50
85.47	Unilateral extended radical mastectomy	19220	19306
85.48	Bilateral extended radical mastectomy	19220-50	19306-50
85.53	Unilateral breast implant	19342	19342
85.54	Bilateral breast implant	19342-50	19342-50
85.95	Insertion of breast tissue expander	19357	19357
85.93	Breast implant revision		
85.94	Breast implant removal		
85.96	Removal breast tissue expander		
Flap reconstruction ICD-9 procedure codes for patients treated at an inpatient facility			
85.7	Total reconstruction of breast		
85.70	Total reconstruction of breast, NOS		
85.71	Latissimus dorsi myocutaneous flap		
85.72	Transverse rectus abdominis myocutaneous (TRAM) flap, pedicled		
85.73	Transverse rectus abdominis myocutaneous (TRAM) flap, free		
85.74	Deep inferior epigastric artery perforator (DIEP) flap, free		
85.75	Superficial inferior epigastric artery (SIEA) flap, free		
85.76	Gluteal artery perforator (GAP) flap, free		
85.79	Other total reconstruction of breast		
85.84	Pedicle graft to breast		
85.85	Muscle flap graft to breast		

**TABLE 2**

Distribution of characteristics among 4,395 breast cancer (invasive or DCIS) patients undergoing mastectomy in an outpatient setting between 2006 and 2009 in four Southern California counties, by reconstruction status, according to the California Office of Statewide Health Planning and Development (OSHPD) database

	<b>Mastectomy alone (N = 3,993) %</b>	<b>Immediate reconstruction (N = 402) %</b>	<b>Total N</b>
Calendar year of surgery			
2006	91.6	8.4	1,070
2007	92.3	7.7	1,149
2008	89.7	10.3	1,129
2009	89.7	10.3	1,047
Age at surgery (years)			
<40	80.9	19.1	162
40–59	87.4	12.7	1,668
60 or older	95.7	4.3	1,791
Unknown	89.3	10.7	774
Race/ethnicity			
Non-Hispanic white	89.2	10.8	1,438
Hispanic white	91.6	8.4	297
African American	94.0	6.0	183
Asian	93.4	6.7	316
Other <sup>a</sup>	92.1	7.9	483
Unknown	90.9	9.1	1,678
Insurance type			
Medicaid	95.1	4.9	513
Medicare	97.5	2.5	631
Private	88.8	11.2	3,169
Other	93.9	6.1	82
Hospital type			
Other	90.8	9.2	4,010
NCI CCC <sup>b</sup>	95.8	4.2	168
Teaching hospital	88.0	12.0	217

<sup>a</sup>Other race/ethnicity includes 6 American Indians/Alaskan natives, 14 native Hawaiians/ other Pacific Islanders, 303 with races other than as stated above, and 160 white with unknown ethnicity

<sup>b</sup>National Cancer Institute designated Comprehensive Cancer Center

**Table 3**

Univariate and multivariate odds ratios (OR) and 95 % confidence intervals (CI) for immediate reconstruction versus mastectomy only among 4,395 breast cancer patients undergoing mastectomy in an outpatient setting between 2006 and 2009 in four Southern California counties

	No. reconstruction/no. mastectomy only	Immediate reconstruction vs. mastectomy only		
		Univariate OR (95 % CI)	p value	Multivariate OR <sup>a</sup> (95 % CI)
Year				
2006	90/980	1.00		1.00
2007	88/1,061	0.9 (0.67–1.23)	0.51	0.92 (0.67–1.26)
2008	116/1,013	1.25 (0.93–1.67)	0.13	1.24 (0.92–1.67)
2009	108/939	1.25 (0.93–1.68)	0.13	1.30 (0.96–1.75)
<i>P trend<sup>b</sup></i>			<i>0.03</i>	<i>0.14</i>
Age at surgery (years) <sup>c</sup>				
<40	31/131	1.00		1.00
40–59	211/1,457	0.61 (0.4–0.93)	0.02	0.58 (0.38–0.88)
60 or older	77/1,714	0.19 (0.12–0.3)	<0.001	0.19 (0.12–0.3)
<i>P trend<sup>b</sup></i>			<0.001	<0.001
Race/ethnicity <sup>d</sup>				
Non-Hispanic white	155/1,283	1.00		1.00
Hispanic white	25/272	0.76 (0.49–1.18)	0.23	0.63 (0.4–0.99)
African American	11/172	0.53 (0.28–1.00)	0.05	0.43 (0.23–0.83)
Asian	21/295	0.59 (0.37–0.95)	0.03	0.54 (0.33–0.88)
Other <sup>e</sup>	38/445	0.71 (0.49–1.02)	0.07	0.60 (0.41–0.88)
Insurance type <sup>f</sup>				
Medicaid	25/488	1.00		1.00
Medicare	16/615	0.51 (0.27–0.96)	0.04	0.92 (0.47–1.78)
Private	356/2,813	2.47 (1.63–3.75)	<0.001	2.87 (1.86–4.43)
Hospital type				
Other	369/3,641	1.00		1.00
NCI CCC <sup>g</sup>	7/161	0.43 (0.2–0.92)	0.03	0.47 (0.22–1.02)
Teaching hospital	26/191	1.34 (0.88–2.05)	0.17	1.66 (1.06–2.61)
				0.03

- <sup>a</sup>Multivariate logistic regression model includes all factors shown in the table
- <sup>b</sup>Ordinal variables were used in all tests for trend
- <sup>c</sup>Subjects with unknown age due to masking of age information are not shown ( $N = 774$ )
- <sup>d</sup>Subjects with unknown race/ethnicity due to masking of race information are not shown ( $N = 1,678$ )
- <sup>e</sup>Other race/ethnicity includes 6 American Indians/Alaskan natives, 14 native Hawaiians/other Pacific Islanders, 303 with races other than as stated above, and 160 white with unknown ethnicity
- <sup>f</sup>Subjects with other type of insurance were not shown ( $N = 82$ )
- <sup>g</sup>National Cancer Institute designated Comprehensive Cancer Center