

# Variation in Breast Cancer Management in Hawaii: A Survey of Physician Practice

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There are persistent, and sometimes substantial, disparities in the quality of care received by the 9 million Americans living with cancer today. A report by the Institute of Medicine's National Cancer Policy Board describes the "fragmented cancer care system" and emphasizes problems of underuse, overuse, and misuse of recommended therapies (Institute of Medicine, 1999).

As the most common cancer among women and with its associated extent of patient advocacy, breast cancer has generated the most controversy about the quality of its care. Recommendations from the National Cancer Institute (NCI) and the National Institutes of Health (NIH) and multiple studies confirm the appropriateness of breast-conserving therapy (Early Breast Cancer Trialists' Collaborative Group, 1992; Early Breast Cancer Trialists' Collaborative Group, 1995; Fisher et al., 2002; National Cancer Institute [NCI], 2003; Nevertheless, less than half of eligible women receive recommended breast-conserving therapy (Morrow et al., 2001). Moreover, up to 33% of women who may benefit from local or adjuvant systemic treatment do not receive it (Bickell, Aufses, & Chassin, 2000; Du, Freeman, Nattinger, & Goodwin 2002; Nattinger, Hoffmann, Kneusel, & Schapira, 2000).

The reasons why some patients do not receive recommended therapies are poorly understood, but the gulf between ideal breast cancer care and actual treatment received appears to be associated with both patient-related factors (Ballard-Barbash, Potosky, Harlan, Nayfield, & Kessler, 1996; Cross, Harris, & Recht, 2002; Joslyn, 2002; Morrow et al., 2001) and physician-related factors (Mandelblatt et al., 2001). Investigators have

Despite broad-based consensus recommendations regarding the management of patients with early-stage breast cancer, physicians vary widely in their approach to these patients. Physicians who treat women with breast cancer in Hawaii were surveyed to determine whether physician knowledge may contribute to this discrepancy between the guidelines and actual practice patterns. Although physicians were able to identify appropriate quality indicators in most cases, substantial variation existed in the management of postmenopausal women and patients with larger tumor size, the recommendation for axillary lymph node dissection, and the referral for reconstruction postmastectomy. Future study is needed to determine how differences in physician knowledge contribute to variation in the quality of breast cancer management.

found the following factors are associated with variation in breast cancer quality of care: patient race (Cross, Harris, & Recht; Joslyn); age (Ballard-Barbash, Potosky, Harlan, Nayfield, & Kessler; Mor et al., 2000; Morrow et al.); socioeconomic status (McGinnis et al., 2000); geographic location (Albain et al., 1996; Farrow, Hunt, & Samet, 1992; Morrow et al.; distance from radiotherapy facilities (Nattinger, Kneusel, Hoffman, & Gilligan, 2001); and type of insurance (Potosky et al., 1997). Physician gender and attitude toward patient participation in treatment decisions are linked to practice variation (Mandelblatt et al., 2001). However, no study has assessed physician knowledge of standard breast cancer management and whether that knowledge, a potentially modifiable factor, is related to quality of care. To examine whether physician knowledge may contribute to variation in the quality of breast cancer care, a survey of all physicians in Hawaii who treat this patient population was performed.

## Key Words

mortality  
quality of care  
surveys

## Methods

### Survey Design

To assess physician knowledge of early breast cancer management, survey questions were developed based on quality indicators supported by the scientific literature and endorsed by the NCI and NIH. "Highly recommended" quality indicators were identified as those clearly defined standards recognized in NCI and NIH publications and consensus statements. These included the following: (a) radiotherapy following breast-conserving surgery for patients with Stage I disease; (b) both radiation and systemic therapy (i.e., chemotherapy and/or tamoxifen) following breast-conserving surgery for patients with tumor size greater than 2 cm; (c) both radiation and systemic therapy following breast-conserving surgery for patients with lymph node metastasis; (d) mammography within 18 months after primary treatment for patients with breast cancer; and (e) axillary lymph node dissection for staging during primary treatment. Because older women may be less likely to receive standard breast cancer treatment than younger patients (Ballard-Barbash, Potosky, Harlan, Nayfield & Kessler, 1996; Morrow et al., 2001), management recommendations for pre- and postmenopausal women were compared. Given that NCI and NIH recommendations for postmenopausal women differ for those older than 70 years from those for women younger (NCI, 2003; NIH, 2000), it was specified that all questions regarding postmenopausal patients were limited to women younger than 70 years.

To evaluate physicians' recommendations regarding less clearly defined treatment options, additional questions to address proposed quality measures lacking consensus in the literature were included. These "proposed" quality indicators included (a) referral to a plastic surgeon following mastectomy and (b) use of sentinel lymph node biopsy for staging during primary treatment.

Multiple choice questions were based on brief clinical scenarios. Physicians were also asked whether they believed that patient ethnicity affects tolerance of chemotherapy, radiation therapy, and treatment recommendations.

### Study Population and Administration

Surveys were mailed to all 81 physicians in Hawaii who treat patients with breast cancer.

Because the management of breast cancer requires a multidisciplinary approach, the study sample included medical, surgical, and radiation oncologists. These physicians were identified through the telephone book and the state medical association.

Surveys were mailed in November 2002, with a single reminder mailing after 1 month. To maintain anonymity, physician specialty was not reported.

### Data Analysis

Survey responses were defined as either consistent or not consistent with the aforementioned quality indicators. Chi-square and Fisher's exact tests were used as appropriate.

## Results

The 81 physicians who were mailed the survey included 28 medical oncologists, 9 radiation oncologists, 3 surgical oncologists, and 41 general surgeons. Sixty-three physicians returned the survey (i.e., 78% response rate).

Overall, 90% of survey questions regarding "highly recommended" quality indicators were answered in accordance with NCI and NIH guidelines (Table 1). In 87% of the clinical scenarios, physicians recommended both adjuvant radiation and systemic therapy after breast-conserving surgery for patients with tumor size greater than 2 cm. Nearly all physicians recommended mammography within 18 months after mastectomy or breast-conserving surgery. Only 70% of respondents reported the routine use of axillary lymph node dissection for staging during primary treatment.

Ninety-five percent of questions for premenopausal women were answered according to national recommendations, as compared with 87% of those for postmenopausal women younger than 70 years ( $p < 0.05$ ). Eighty-one percent of respondents recommended both adjuvant radiation and systemic therapy after breast-conserving surgery for postmenopausal patients younger than 70 years with tumor size greater than 2 cm, whereas 92% recommended the same treatment to premenopausal patients with the same tumor size ( $p = 0.07$ ). Slightly more responses pertaining to Stage I disease agreed with the guidelines, as compared with those pertaining to Stage II (94% vs. 90%,  $p = 0.20$ ).

Whereas physicians answered 90% of questions regarding "highly recommended" quality indicators in accordance with consensus

**Table 1.** Proportion of Responses Meeting Quality Measures ( $n = 63$  respondents)

| Quality Measure   | Percentage of Responses Meeting Measure |               |                             |
|---|---|---------------|-----------------------------|
|   | All Patients                            | Premenopausal | Postmenopausal<br><70 years |
| <b>Highly recommended quality indicators</b>  |   |               |                             |
| 1. Radiation therapy following BCS <sup>a</sup> for patients with stage I breast cancer                           | 94                                      | 95            | 92*                         |
| 2. Radiation and systemic therapy <sup>b</sup> following BCS <sup>a</sup> for patients with tumor size >2 cm      | 87                                      | 92            | 81*                         |
| 3. Radiation and systemic therapy <sup>b</sup> following BCS <sup>a</sup> for patients with lymph node metastasis | 93                                      | 97            | 89*                         |
| <b>Percentage of responses meeting 1–3</b>  |   | <b>95</b>     | <b>87**</b>                 |
| 4. Mammography within 18 months after BCS <sup>a</sup>  | 98                                      | —             | —                           |
| Mastectomy  | 100                                     | —             | —                           |
| 5. Axillary lymph node dissection routinely used for staging during primary treatment.                            | 70                                      | —             | —                           |
| <b>Percentage of responses meeting 4, 5</b>   | <b>90***</b>                            |               |                             |
| <b>Proposed quality indicators</b>  |   |               |                             |
| 1. Routinely used for staging during primary treatment  |   |               |                             |
| Sentinel lymph node biopsy  | 46                                      | —             | —                           |
| Both axillary lymph node dissection and sentinel node biopsy  | 29                                      | —             | —                           |
| 2. Referral to a plastic surgeon after mastectomy   | 29                                      | —             | —                           |
| <b>Percentage of responses meeting 1, 2</b>   | <b>37***</b>                            |               |                             |

<sup>a</sup>BCS = breast-conserving surgery  
<sup>b</sup>Systemic therapy includes chemotherapy and/or hormonal therapy as appropriate.  
\* $p > .05$  (not statistically significant)  
\*\* $p < .05$ , post- vs. premenopausal  
\*\*\* $p < .0001$ , "proposed" vs. "highly recommended" quality indicators

recommendations, they agreed with the "proposed" quality indicators in only 37% of questions ( $p < .0001$ ). However, there was substantial variation within this group. Forty-six percent of respondents recommended sentinel lymph node biopsy for routine staging during primary treatment, with 17% recommending sentinel node biopsy alone and 29% recommending both axillary lymph node dissection and sentinel node biopsy. Only 29% of physicians routinely refer patients to a plastic surgeon following mastectomy.

Although 13% of physicians believed patient ethnicity affects tolerance of adjuvant chemotherapy and 3% believed it affects tolerance of radiation therapy, none reported that ethnicity influences treatment recommendations.

## Discussion

Despite a broad consensus on standard care for patients with early breast cancer, studies

have shown substantial variation in the quality of care these patients receive. Through a survey of self-reported practice, an attempt was made to determine whether physician knowledge might account for observed management discrepancies.

It was found that physician recommendations are generally consistent with nationally accepted guidelines for the management of early breast cancer, with responding physicians identifying the "highly recommended" quality measures 90% of the time. There is, however, substantial variation within this "highly recommended" category. Despite NCI/NIH guidelines, 13% of physicians do not routinely recommend both radiation and systemic therapy for women with tumor size greater than 2 cm, and 30% do not routinely recommend axillary lymph node dissection for staging during primary treatment (NCI, 2003; NIH, 1990, 2000).

It was also found that significantly fewer physicians recommend standard breast cancer treatment for postmenopausal women than for premenopausal women with the same tumor characteristics. Although NCI and NIH guidelines specify that adjuvant therapies are appropriate for postmenopausal women, (NCI, 2003; NIH, 2000) this finding is consistent with evidence suggesting that postmenopausal women may be treated less aggressively and receive less recommended care than premenopausal women (Ballard-Barbash, Potosky, Harlan, Nayfield & Kessler 1996; Du & Goodwin, 2001; Morrow et al., 2001). Furthermore, questions for postmenopausal women were limited to those patients younger than 70 years, given the recommendation in NCI and NIH guidelines that treatment in older patients be particularly individualized (NCI, 2003; NIH, 2000).

Physicians responded with less consistency to questions concerning the “proposed” quality indicators—sentinel lymph node biopsy and referral for post mastectomy reconstruction—likely reflecting the lack of consensus within the community and highlighting the need for broad support from national organizations and the medical community before proposed quality indicators may be widely used to assess quality of care. Forty-six percent of physicians reported that they routinely recommend sentinel lymph node biopsy for staging during primary treatment. Although recent studies have supported the utility of sentinel node biopsy (Miltenburg, Miller, Karamlou, & Brunicardi, 1999; Veronesi et al., 2003; Wong et al., 2001) and many oncologists have accepted this as “standard of care” (Edge, et al., 2003), NCI recommendations state that sentinel node biopsy should not yet replace complete axillary lymphadenectomy for staging during primary treatment (NCI, 2003). Similarly, although referral to a plastic surgeon has been proposed as a quality indicator in breast cancer management (Hillner et al., 1997), it has not been included as a consensus recommendation in NCI/NIH statements (NCI, 2003; NIH, 1990, 2000).

Little is known about physician knowledge of standard breast cancer management in other areas of the United States. Whether variations in physician knowledge affect the quality of breast cancer care or survival is also unclear.

There are several limitations to this study. First, although these findings suggest physician knowledge may account for some of the variation in breast cancer treatment previously described in other studies, many other patient- and physician-related factors influence the management of patients with early breast cancer, and the relative “weight” or importance of physician knowledge is unknown. Second, although all physicians who treat breast cancer in the state of Hawaii were surveyed, there may be regional differences in the approach to cancer management, and these particular results may not be applicable to other populations. However, data suggest that breast cancer management in Hawaii is comparable to that in other areas of the United States, whereas mortality in these patients is lower than that in the remainder of the nation. A recent study demonstrated that adherence to quality indicators is similar to national standard of practice, with 53% of patients with early-stage disease receiving breast conserving surgery in Hawaii (Maskarinec, Dhakal, Yamashiro, & Issell, 2002) compared with reported rates ranging from 33% to 64% nationwide (Guadagnoli et al., 1998; Hillner, 1997; Morrow, 2001).

Future assessments of actual practice, and its relation to physician knowledge and specialty, are needed to clarify further the reasons for variations in breast cancer management.

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