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Outcomes of Recommendations for Breast Biopsies in Women Receiving Mammograms from a County Health Van

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SYNOPSIS

Objective. To describe the outcomes of breast biopsy recommendations for women screened through a mobile mammography van.

Methods. Data on all women screened through the Mobile Mammography Program in Suffolk County, Long Island, NY, from 1990 to 1994 were analyzed to determine biopsy recommendation rates, biopsy rates, positive biopsy rates, and cancer detection rates. Follow-up information was obtained from the women's physicians.

Results. The breast cancer detection rate for women screened through the Mobile Mammography Program averaged 0.33% over a five-year period. The biopsy recommendation rate based on abnormal mammograms remained stable, at about 1% to 2%, over a five-year period, as did the rate of positive biopsies among women having biopsies (36.8% to 44.4%). For women ages 50 and older, the cancer rate in 1994 was 0.36%, while for women younger than age 50, the cancer rate was 0.25% (0.32% for all ages).

Conclusions. These findings show that a breast cancer screening program using a mobile van can have comparable cancer detection rates to national figures and a fairly stable biopsy recommendation rate from which follow-up resource needs can be estimated.

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There has been considerable focus in the medical and public health literature on barriers to breast cancer screening and on the design and evaluation of strategies to reduce these barriers. Little has been written, however, on the follow-up of abnormal mammograms or, in particular, on the outcome of recommendations for biopsy. Nevertheless, follow-up is a critical step in any screening program and of particular concern in screening low-income women for whom the cost of follow-up may not be covered or provided through public programs.

Although the use of mammography screening varies by income,[1] low-income women who use a county health center as a regular source of care can have rates of use equivalent to women in the community.[2] Since 1990, the Suffolk County, NY, Department of Health Services has provided a mobile mammography van that has been successful in increasing mammography examinations among women who use community health centers.[3]

The Suffolk County Department of Health Services operates eight health centers. Department data for 1994 showed that approximately 32% of the patients seen in these health centers were covered by Medicaid, while 6% were covered by Medicare. Another 10% had private insurance, and 51% were self-pay or no-charge patients.

The mammography van visits county health centers and community locations six days a week. Thirty women per day are scheduled on the van, and approximately 20 women per day keep their appointments. Each woman obtains a clinical breast examination, instruction on self-examinations, and a two-view mammogram interpreted by Board-certified radiologists. The van is staffed by a registered nurse, a radiology technician, and a clerical worker. The van is certified by New York State and accredited by the American College of Radiology.

The Suffolk County Mobile Mammography Program follows the American Cancer Society's recommendations for the frequency of breast cancer screening based on age. According to the Mobile Program's procedures, patients older than age 40 do not need a physician's referral. If insurance does not cover the cost, a fee is billed on a sliding scale from zero to $80, which is below the typical charge for a mammogram obtained in Suffolk County.

All women with abnormal mammograms are contacted by health department personnel by telephone or registered mail. If the woman provides the name of her regular physician, the physician is also contacted. If a woman does not have a regular physician, she is offered a follow-up appointment at one of the health centers.

METHODS

Data from the Suffolk County Mobile Mammography Program are retained in a Paradox database that is used by the health department in tracking patient follow-up, as described in this paper for the years 1990 through 1994.

Three to six months after an abnormal mammogram, health department personnel write to the physician of a woman recommended for a biopsy for follow-up information about whether the woman has obtained a biopsy and,

Table 1. Outcomes for women tested through a mobile mammography van, Suffolk County, NY, 1990 to 1994

Variable	*1990*	*1991*	*1992*	*1993*	*1994*
Number of mammograms performed	3062	3660	4062	4147	4349
Number of biopsies recommended	52	74	68	42	59
Biopsy recommendation rate (percent)	1.7	2.0	1.7	1.0	1.3
Number of biopsies performed	27	38	32	26	34
Biopsy rate (percent)	0.9	1.0	0.8	0.6	0.8
Number of cancer cases	12	14	13	11	14
Positive biopsy rate (percent)	44.4	36.8	40.6	42.3	41.1
Cancer detection rate (percent)	0.39	0.38	0.32	0.26	0.32

Biopsy recommendation rate = number of women for whom biopsies were recommended divided by the number of mammograms performed
Biopsy rate = number of biopsies performed divided by the number of mammograms performed
Positive biopsy rate = number of women detected with cancer divided by the number of biopsies performed
Cancer detection rate = number of women detected with cancer divided by the number of mammograms performed

if so, the results. For women who have not had biopsies, the letter asks why the biopsy was not performed and if any additional diagnostic studies have been performed. If the physician does not respond to the letter and in cases that require clarification, health department personnel contact the physician by telephone.

For each year, we calculated the biopsy recommendation rate, the biopsy rate, the positive biopsy rate, and the cancer detection rate. The *biopsy recommendation rate* is the number of women for whom biopsies were recommended divided by the total number of mammograms performed in that year; the *biopsy rate* is the number of biopsies performed during the year divided by the number of mammograms performed; the *positive biopsy rate* is the number of women detected with cancer divided by the number of biopsies performed; and the *cancer detection rate* is the number of women detected with cancer divided by the number of mammograms performed.

For 1994, the latest year for which data were available, a separate analysis was performed to examine age differences in these rates. For this analysis, women under 50 years of age were compared with those 50 years of age and older because there has been greater uniformity in national recommendations for screening of women over 50.

RESULTS

In Suffolk County, the biopsy recommendation rate, biopsy rate, and positive biopsy rate remained stable over the five-year period (Table 1).

Table 2 presents more detailed analyses for 1994. In that year, 4349 mammograms were performed on 4157 women, of whom 3428 (82%) were Suffolk County health center patients. Only 995 were baseline mammograms (23%), while 3354 (77%) of the mammograms were repeat studies.

Fifty-nine women were referred for biopsy in 1994 based on mammography results, and 34 biopsies were performed. Among the 25 women who did not obtain biopsies, 17 received other types of follow-up, according to information obtained from their physicians: three refused a biopsy after consultation with a physician and 14 were advised by a physician not to have a biopsy. In addition, one woman died before receiving any follow-up, and two women who moved planned to follow up elsewhere. The remaining five women failed to seek appropriate follow-up.

Of the 34 biopsies performed, 20 were benign and 14 resulted in a diagnosis of cancer. Of the women diagnosed with cancer, 10 were in the 50 years old and older group and four were younger than 50. The age at diagnosis ranged from 30 to 82 years.

In 1994, the cancer detection rate was 0.32% among women screened, or 3.2 per 1000 mammograms performed. The biopsy recommendation rate was similar for women ages 50 or older (1.5%) and those younger than 50 (1.1%). However, the positive biopsy rate differed considerably—53% for women 50 and older compared with 27% for women younger than 50.

Table 2. Results of breast biopsy recommendations for women tested through a mobile mammography van, Suffolk County, NY, 1994

Variable	*Younger than 50*	*Ages 50 and older*	*All ages*
Number of mammograms performed	1571	2774	4349
Number of biopsies recommended	18	41	59
Biopsy recommendation rate (percent)	1.1	1.5	1.3
Number of biopsies performed	15	19	34
Biopsy rate (percent)	1.0	0.7	0.8
Number of cancer cases	4	10	14
Positive biopsy rate (percent)	27	53	41
Cancer detection rate (percent)	0.25	0.36	0.32

Biopsy recommendation rate = number of women for whom biopsies were recommended divided by the number of mammograms performed
Biopsy rate = number of biopsies performed divided by the number of mammograms performed
Positive biopsy rate = number of women detected with cancer divided by the number of biopsies performed
Cancer detection rate = number of women detected with cancer divided by the number of mammograms performed

DISCUSSION

Rates of cancer detection by mammography vary based on a range of factors, including the technician's experience, the equipment, and the population screened.[4] National reports indicate that incident cancer detection rates based on mammography range from 2 to 4 per 1000 previously screened women to 6 to 10 per 1000 newly screened women, among whom prevalent cases are being detected.[5] The majority of women screened in 1994 had had previous mammograms. The Suffolk County Mobile Mammography Program detected 3.2 cases per 1000 mammograms performed, which is consistent with national incident cancer detection rates. More cases may have been detected at a later date among women who obtained subsequent mammograms or who moved and sought care elsewhere.

Additional biopsies may have been performed at a later time among women recommended for other kinds of follow-up (requests for additional views, follow-up with ultrasound, comparison with prior films, consultation with a surgeon, or needle aspiration). Because of this, it is possible that our findings understate the biopsy and cancer detection rates. Breast biopsies resulting from other initial follow-up have been shown to have a lower positive predictive value than breast biopsies performed immediately following and based on mammography results.[6]

The results of breast cancer screening from 1994 were similar to results from previous years. Women ages 50 and older who obtained a biopsy in 1994 were almost twice as likely to be diagnosed with breast cancer as women younger than 50, yet 27% of the women younger than 50 who underwent biopsies were diagnosed with breast cancer.

Our findings indicate that a county breast cancer screening experience can have a comparable yield in cancer detection rates to national figures and a fairly stable biopsy recommendation rate from which follow-up resource needs can be estimated. Physician consultation explained most of the disparity between the biopsy recommendation rate and the biopsy performance rate, which was primarily due to the use of other diagnostic studies. Despite repeated attempts by the health department to encourage follow-up through telephone calls and registered letters to women for whom biopsies were recommended, five women failed to seek appropriate follow-up. An unpublished review of the Mobile Mammography Program's 1990 and 1991 cases (Eileen Schneider, MD, 1993) found that failure to seek follow-up related primarily to fear or denial and not to cost. The current availability of less invasive techniques, such as stereotactic biopsy, may reduce noncompliance among those who resist operative procedures.

Since 1995, the van has also provided breast cancer screening for the Suffolk Health Plan, a Medicaid managed care plan operated by the Suffolk County Department of Health Services. The availability of the mammography program helps the County meet the performance measures set by the National Committee on Quality Assurance for the Health Employer Data and Information Set (HEDIS).[7] A recent addition of a second mammography van has enabled the Mobile Mammography Program to meet the increased demand for this service, with continued monitoring of appropriate follow-up for definitive diagnosis.

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