

# Delay in Diagnostic Testing After Abnormal Mammography in Low-Income Women

Debra Wujcik, PhD, RN, AOCN®, Yu Shyr, PhD, Ming Li, PhD, Margaret F. Clayton, PhD, APRN-BC, Lee Ellington, PhD, Usha Menon, PhD, RN, and Kathi Mooney, PhD, RN

**B**reast cancer is the most frequently diagnosed cancer in women, representing 26% of all female cancers. Furthermore, 192,370 new cases of invasive breast cancer will be diagnosed in women in 2009 (Jemal et al., 2009). As with all cancers, a disparity in breast cancer incidence and mortality exists (American Cancer Society [ACS], 2009a; Jemal et al.). The overall incidence of breast cancer is 12%, lower in African American women than Caucasian women, but higher in African Americans aged 40 years or older (ACS, 2009b). However, in the most recent reporting period, 2000–2003, African American women had a 36% higher death rate than Caucasians. The overall five-year relative survival after breast cancer is 77% for African American women and 90% for Caucasians. The survival differential is attributed to many variables, including access to early detection services, treatment differences, lack of insurance, and tumor and clinical characteristics (Bradley, Given, & Roberts, 2001; Chu, Lamar, & Freeman, 2003).

## Screening Mammography

A baseline screening mammogram is recommended for all women aged 40 years and older, and annual mammograms are recommended for women aged 45 years and older (ACS, 2009a). Mammograms have been shown to identify breast cancer effectively at an early stage, with subsequent improvement in survival and cure rates (Buseman, Mouchawar, Calonge, & Byers, 2003; Elmore, Armstrong, Lehman, & Fletcher, 2005; Gotzsche & Nielsen, 2006.) Four percent to 7.1% of women are diagnosed with breast cancer after screening mammography (Eheman et al., 2006). Because the lowest rates of reported mammography occur in uninsured women and in those with no usual medical care, much effort has been made to provide free screening

**Purpose/Objectives:** To identify factors associated with diagnostic delay after an incomplete or abnormal mammogram among women participating in a state mammography screening program.

**Research Approach:** Retrospective case-control design using bivariate and multivariate logistic regression analyses to explore the associations between age, race, ethnicity, marital status, breast cancer history, and self-reported breast symptoms and delay.

**Setting:** A statewide program of free screening mammography for women who are under- or uninsured.

**Participants:** 11,460 women enrolled in a free, statewide screening program from 2002–2006.

**Methodologic Approach:** Using the Tennessee Breast and Cervical Cancer Screening Program database, further analyses were conducted.

**Main Research Variables:** The outcome measure was delay in completion of all diagnostic tests and was defined as women who did not complete testing within 60 days.

**Findings:** Thirty-seven percent of women required follow-up, and of a subset used in the analysis, 30% experienced delay of more than 60 days. Controlling for marital status, age, and breast cancer history, women who experienced delay were more likely to be African American versus Caucasian (odds ratio [OR] = 1.45, 95% confidence interval [CI] = 1.13, 1.85) or Hispanic (OR = 0.72, 95% CI = 0.55, 0.93) and to have self-reported breast symptoms (OR = 1.50, 95% CI = 1.27, 1.77).

**Conclusions:** In a sample of women with low income needing mammography follow-up, delay was associated with three intrapersonal variables, potentially reducing the effectiveness of mammography screening for women who were African American, or Hispanic, or had self-reported breast symptoms.

**Interpretation:** Nurses providing cancer screening examinations are uniquely positioned to assess the knowledge, beliefs, and resources of women using the program and to navigate women through barriers to completion. Knowledge of factors associated with delay is valuable for planning interventions and allocating program resources.