

# The Impact of Patient-Initiated Subspecialty Review on Patient Care

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## Abstract

**Purpose:** To determine the effect of subspecialty review of breast imaging on patients without a diagnosis of breast cancer who self-referred for a second opinion.

**Methods:** Institutional review board–approved retrospective review was performed of 415 breast imaging studies submitted to our cancer center for second-opinion review by 245 patients in 2014, excluding cases without follow-up or change in original BI-RADS 0 assessment. One hundred forty-seven patients with 176 lesions were included. Original and second-opinion interpretations and recommendations were compared with histopathology or follow-up imaging.

**Results:** Ninety-six of 176 (55%) lesions were reported as suspicious in the original interpretation. Second-opinion review was discordant with the original interpretation in 82 of 176 (47%) lesions. Second-opinion review downgraded 24 of 96 (25%) lesions originally reported as suspicious to benign or probably benign, averting biopsy of these lesions. Second-opinion review upgraded 31 of 80 (39%) lesions originally reported as benign or probably benign to suspicious. A total of 87 lesions were biopsied yielding malignancy in 23 (26%) biopsies. Twenty-eight of 87 (32%) biopsies performed were recommended after second-opinion review, with 8 of 28 (29%) of these biopsies yielding cancer. Eight of 23 (35%) cancers detected represented malignancy not initially detected in the original interpretation.

**Conclusion:** Second-opinion review is valuable in patients pursuing a breast imaging specialist's opinion, even before they are diagnosed with breast cancer. Second-opinion review disagreed with the original interpretation for 47% of lesions, averted 25% of originally recommended biopsies, and detected cancer in 29% of additional biopsies recommended. Thirty-five percent of cancers diagnosed after second-opinion review were not initially detected in the original interpretation.

**Key Words:** Second opinion, breast cancer, cancer center, biopsy

*J Am Coll Radiol* 2018;■:■-■. Copyright © 2018 American College of Radiology

## INTRODUCTION

Breast cancer is the most commonly occurring non-cutaneous cancer for women in the United States today. The American Cancer Society estimates that 255,180 new cases of invasive breast cancer and an additional 63,410 cases of carcinoma in situ will be diagnosed in 2017 [1]. After diagnosis, many women with a new mammographic or sonographic

finding will often seek a second opinion from a breast imaging specialist at another institution. This is supported in the literature in which studies have demonstrated that specialists outperform general radiologists in detecting additional cancers on screening and diagnostic mammography while also having lower recall rates, thus improving patient satisfaction and effectiveness of care [2,3].

Studies show that in patients with a new breast cancer diagnosis who are about to undergo surgery, second-opinion review significantly impacts surgical management when additional sites of malignancy are detected [4-7]. Multidisciplinary second-opinion review conducted in these patients along with direct consultation with the pathologist, surgeon, and radiation and medical oncologists leads to more comprehensive and coordinated

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This research was funded in part through the NIH/NCI Cancer Center Support Grant P30 CA008748. The authors have no conflicts of interest related to the material discussed in this article.

care converting breast conservation to mastectomy in up to 60% of patients and altering nonsurgical treatment plans in up to 43% of patients [4,7,8].

Although the literature supports the utility of rendering second opinions on outside imaging in such patients, there are sparse data for its utility in patients who neither have a new breast cancer diagnosis nor are scheduled for surgery. The purpose of this study was to determine the effect of second-opinion review on the biopsies performed in patients with breast imaging who were not referred by a breast surgeon. We hypothesized that second-opinion review in this patient cohort would similarly reduce the number of unnecessary benign biopsies performed and increase the number of biopsies yielding malignancy with a high positive predictive value (PPV).

## METHODS

The institutional review board approved and gave a waiver of informed consent for this HIPAA-compliant, retrospective, single-institution study performed at a tertiary cancer care center.

### Selection and Description of Participants

We performed a retrospective search of our institutional clinical database to identify all patients who (1) had submitted a mammogram, breast ultrasound, or breast MRI performed and initially interpreted at an outside institution and (2) were issued an official second-opinion report signed by a breast imaging specialist at our institution between January and December 2014. Patients were excluded if they (1) had no follow-up after second-opinion review or (2) submitted outside imaging with an incomplete assessment (BI-RADS 0) that was also upheld during second-opinion review for the same finding(s).

### Second-Opinion Review

All second-opinion studies were interpreted by 17 board-certified radiologists specializing in breast imaging with 1 to 25 years of clinical experience. Original BI-RADS categories were not formally re-assigned in the second-opinion reports per our institutional policy.

### Technical Information and Reference Standards for This Study

We compared recommendations for each lesion on the original outside report with those of the second-opinion report. Discordance after second-opinion review was classified as one of the following four categories:

A (benign or probably benign lesion upgraded to suspicious), B (suspicious lesion downgraded to probably benign or benign), C (probably benign lesion or lesion requiring additional imaging downgraded to benign), and D (tissue sampling method for a suspicious lesion was modified).

Subsequently, we compared second-opinion findings with either histopathology or follow-up imaging. Suspicious imaging findings detected and biopsied after second-opinion review were compared with histopathology obtained at our institution (via image-guided biopsy or surgery) and PPVs were determined. Benign or probably benign imaging findings were compared with available imaging follow-up classified as greater than 2 years, 1 to 2 years, or less than 1 year.

### Statistical Analysis

Exact 95% confidence intervals (CIs) are presented for the comparison of second-opinion review of suspicious findings against reference standards.

## RESULTS

### Study Population

Two-hundred forty-five self-referred patients submitted breast imaging for second-opinion review at our cancer center in 2014. All patients were women except for one man. Patient age ranged from 18 to 97 years with a mean of 32 years. A personal history of treated breast cancer or other malignancy was reported in 5% and 2% of patients, respectively. Four hundred fifteen studies were reviewed, which included 228 mammograms (55%), 169 ultrasounds (41%), and 18 MRI studies (4%). Over 75% of the studies were initially interpreted in the community setting, with 56% originating from private community-based practices and 20% from community hospitals. Twenty-three percent of studies came from other academic institutions and their affiliate sites. One study was originally interpreted in another country, and the source of three studies was unknown (1%).

A total of 147 patients were included in the study after excluding 98 patients, of whom 79 (81%) were without follow-up and 19 (19%) had concordant BI-RADS 0 assessments. The BI-RADS assessments reported in the original interpretation were benign (BI-RADS 1 or 2) in 12 of 147 (8%) patients, probably benign (BI-RADS 3) in 46 (31%) patients, suspicious (BI-RADS 4 or 5) in 83 (56%) patients, and incomplete (BI-RADS 0) in 6 (4%) patients. Fifty-eight percent of

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