Infrared Imaging of the Breast: Initial Reappraisal Using High-Resolution Digital Technology in 100 Successive Cases of Stage I and II Breast Cancer

J. R. Keyserlingk, MD,*‡ P. D. Ahlgren, MD,*‡ E. Yu, MD, PhD,†‡ and N. Belliveau, MD‡

*Department of Oncology, St. Mary's Hospital, Montreal, Quebec;
†Department of Radiotherapy, London Cancer Center, London, Ontario; and
‡Ville Marie Breast and Oncology Center, Montreal, Quebec, Canada

■ **Abstract:** There is a general consensus that earlier detection of breast cancer should result in improved survival. Current breast imaging relies primarily on mammography. Despite better equipment and regulation, variability in interpretation and tissue density still affect accuracy. A number of adjuvant imaging techniques are currently being used, including doppler ultrasound and gadolinium-enhanced MRI, which can detect cancer-induced neovascularity. In order to assess the potential contribution of currently available high-resolution digital infrared technology capable of recognizing minute regional vascular flow related temperature variation, we retrospectively reviewed the relative ability of our preoperative clinical exam, mammography, and infrared imaging to detect 100 new cases of ductal carcinoma in situ, stage I and II breast cancer. While the false-negative rate of infrared imaging was 17%, at least one abnormal infrared sign was detected in the remaining 83 cases, including 10 of the 15 patients, a slightly younger cohort, who had nonspecific mammograms. The 85% sensitivity rate of mammography alone thus increased to 95% when combining both imaging modalities. Access to infrared information was also pertinent when confronted with the relatively frequent contributory but equivocal clinical exam (34%) and mammography (19%). The average size of those tumors undetected by mammography or infrared imaging was 1.66 cm and 1.28 cm, respectively, while the false-positive rate of infrared imaging in a concurrent series of 100 successive benign open breast biopsies was 19%. Our initial experience would suggest that, when done concomitantly with clinical exam and mammography, high-resolution digital infrared imaging can provide additional safe, practical, and objective information. Further evaluation, preferably in controlled prospective multicenter trials, would provide valuable data. ■

Key Words: breast, cancer, detection, imaging, infrared

Address correspondence and reprint requests to: J. R. Keyserlingk, MD, Division of Surgical Oncology, St. Mary's Hospital, 3830 Lacombe Avenue, Suite 2304, Montreal, Quebec, Canada H3T 1M5, or e-mail: vilmarie @sympatico.ca

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Our first-line strategy for the detection of breast cancer still depends essentially on clinical examination and mammography. Limitation of the former, with its reported sensitivity rate below 65% is well-recognized (1), and even the proposed value of breast