

# Hot bodies; Cold War: the forgotten history of breast thermography

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In 2012, Health Canada announced that thermography would no longer be considered a viable method of screening Canadian women for breast cancer.<sup>1</sup> Images produced by thermographic methods were deemed less accurate than those produced by mammography and, therefore, were of little clinical value. Physicians and cancer control organizations have since rallied against thermography, suggesting that the use of the technique is not only ineffective but dangerous as well, giving women a false sense of security about their breast health. Claiming that the technique hurts far more than it helps, these organizations have issued cease and desist orders against medical clinics that offer breast thermography services and have urged women in Canada to consider more conventional methods of screening for breast cancer, such as mammography and breast self-examination.

However, the technique was not always thought of as a risky screening practice. It was perceived as cutting-edge medical science from the late 1950s to the early 1970s. It was also a source of national pride, because this new method of medical visualization was pioneered by Montréal surgeon, Dr. Ray Newton Lawson. Histories of thermography tend to gloss over Lawson's role in harnessing and repurposing infrared imaging for screening for breast cancer.<sup>2</sup> In light of recent debates over the technology's place in Canadian cancer control, it seems apt to explore the local history of this controversial imaging technique by focusing on the unique social, technological and industrial contexts that allowed breast thermography to emerge and flourish within the mid-20th century.

Ray Newton Lawson (Figure 1)<sup>3</sup> was born in 1912 in London, Ontario, to Helen Newton and Ray Lawson Sr., the President of Federal Aviation and 27th Lieutenant Governor of



**Figure 1:** Dr. Ray Newton Lawson shown with a later iteration of his infrared scanner.<sup>3</sup>

Ontario. Lawson attended the University of Western Ontario, graduating in 1937 with both a bachelor of arts degree and an undergraduate degree in medicine. When World War II broke out, Lawson became a physician in the Royal Canadian Air Force and was stationed at the newly developed base for the British Commonwealth Air Training Plan in Dafoe, Saskatchewan. After the war ended, he decided to pursue surgery as a medical specialty. In 1944, he accepted an Edward W. Archibald Residential Fellowship in Experimental Surgery at McGill University

(Montréal). Upon graduation, he accepted a position in general surgery at Montreal's Royal Victoria Hospital, where he would remain until 1972.

Because surgery was one of the primary methods of cancer treatment during the mid-20th century, Lawson would frequently encounter patients with cancer in the operating room. His interest in breast cancer, specifically, seems to have been fully formed by the mid-1950s, when Lawson contributed a chapter on diseases of "The Breast" to the second edition of Fred

Moseley's *Textbook of Surgery*.<sup>4</sup> He also published a two-page article on breast cancer in the *Canadian Medical Association Journal*.<sup>5</sup> In these works, Lawson drew attention to the rising rates of breast cancer in Canada, characterizing the disease as a substantial health problem for Canadian women from 40 to 60 years of age.

Still, he was unable to do much to address the issue until the early 1950s, when he discovered that breast tumours elicited heat, with the temperature of a malignant nodule being, on average, 1.75 to 3.5 degrees higher than that of the surrounding breast.<sup>6</sup> The idea that malignant lesions were hotter than the rest of the body was noteworthy, because it suggested that breast cancer could be detected through heat measurement, as opposed to the intrusive, and often inaccurate, practice of surgical biopsy. Thus, from the late 1950s to the early 1960s, Lawson worked to develop this new heat-sensitive method of cancer diagnosis.

Lawson's first foray into the field of diagnostic imaging took place in 1956, when he attempted to find a device that could accurately record the surface temperatures of the female breast. It was this search that led him to the field of infrared technology, an area that had been flourishing in the Cold War context of military weapons development. In February of 1956, Lawson read an article in *TIME* magazine that described the recent declassification of the Baird Evapograph, an infrared imaging instrument that had been used by the American Department of Defence in the development of heat-seeking missiles and "night-vision" surveillance systems.<sup>7</sup> Inspired by this article, Lawson thought that this infrared technology could also contribute to the field of breast cancer detection, because it had the capacity to map temperature distribution over the body's surface.

Likely capitalizing on his father's connections to the aerospace industry, Lawson was able to secure a meeting with Dr. P. Baird who "graciously agreed to permit an examination of two patients with his device."<sup>8</sup> With the assistance of Infrared Industries of Santa Barbara, California, as well as a grant from the National Cancer Institute of Canada, from 1956 to 1962 Lawson endeavoured to transform this



**Figure 2:** Infrared imager called the "Thermoscan."<sup>9</sup>

military-grade tool into a new diagnostic imaging technology, which he called the Thermoscan (Figure 2).<sup>9</sup> This device was able to produce a life-size heat map of a patient's body, creating a permanent record of observed heat patterns that could be either condensed, amplified or saved for future reference.

With a screening time of less than 30 seconds and a temperature discrimination of 0.1°C or less, the Thermoscan found much favour within the medical marketplace. Not only was the invention of this new method for the detection of breast cancer advertised in many popular magazines and newspapers, but it was also touted by many national and international medical organizations.<sup>10</sup> Using rhetoric characteristic of the Cold War period, breast thermography was

celebrated as a "fabulous new way of seeing," a method of medical imaging that had the potential to revolutionize the field of cancer screening by allowing doctors to see what no health care professional had ever seen before.<sup>11</sup> As a result, hospital directors began to integrate this new visualization technology into their institutions' existing centres for cancer care.

Although thermography is now regarded as an inferior practice by many Canadian medical communities, the thermal imaging device crafted by Ray Newton Lawson in the late 1950s did much for the development of modern techniques for the screening of breast cancer. Not only did it open the door for noninvasive methods for diagnosis of breast cancer, but his thermal imaging technology also facili-

tated the development of better prevention, detection and screening techniques within Canada. Lawson's story also sheds light on how futuristic optimism, military modernization and increased interest in the radiation sciences affected the development of Canadian medical technologies.<sup>12</sup> Rather than being remembered as a "useless procedure," breast thermography should be remembered for what it was: a technology of the Cold War that, through medical optimism and technological tinkering, was transformed into a pioneering means of lowering the risk of cancer among women in Canada.

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