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Deteriorating wait times for breast cancer patients at a regional hospital in BC, 2013 versus 2023

Treating breast cancer is an interdisciplinary endeavor, but delays among the various independently functioning components of the care continuum have contributed to increasing wait times.

ABSTRACT

Background: Breast cancer is a common condition, and the number of cases is projected to increase 52% between 2012 and 2030. Care of breast cancer patients occurs along an interdisciplinary continuum involving family physicians, general surgeons, radiologists, pathologists, medical oncologists, radiation oncologists, and allied health workers. There are national benchmarks for wait times between each step from diagnosis to treatment. In this quality improvement project, we

sought to measure these wait times at our hospital by comparing results for 2013 and 2023, identifying causes of delays, and proposing solutions to reduce wait times.

Methods: We included all patients who were diagnosed with breast malignancies and referred to the general surgery service at Vernon Jubilee Hospital in 2013 and 2023. Results were analyzed using the two-tailed t test and Fisher exact test for continuous and categorical variables, respectively. A P value less than .05 was considered significant.

Results: The number of patients increased from 69 in 2013 to 113 in 2023. Mean wait times from initial imaging referral to surgery increased from 67 to 114 days (P < .01) during this period. Mean wait times from imaging referral to pathology diagnosis increased from 36 to 71 days (P < .01), due primarily to an increase from 34 to 80 days for symptomatic patients who were referred by their family physician (P < .01); wait times for asymptomatic patients who were identified by the Screening Mammography Program increased from 40 to 58 days (P = .09). Mean wait times from biopsy to final biomarker report (ER/PR/HER2) increased from 25 days to 29 days (P = .25), from surgery to final pathology increased from 11 to 17 days (P < .01), from surgical consultation to surgery increased from 17 to 31 days (P < .01), from referral to medical oncology consultation increased from 14 to 30 days (P < .01), and from referral to radiation oncology consultation increased from 78 to 106 days (P = .025). Most wait times met benchmark wait times in 2013 but failed to meet them in 2023.

Conclusions: Wait times increased at every stage of the care continuum for breast cancer patients between 2013 and 2023 at Vernon Jubilee Hospital. Implementing an interdisciplinary approach to care is necessary to remediate sources of delays at each step. Possible solutions include creating a fast-track pathway for symptomatic patients, performing biomarkers and pathology slide preparation locally, increasing operating room time, and tripling the number of oncologists in the region.

Background

Breast cancer is a common condition among Canadian women, with one in eight diagnosed within their lifetime. Despite stable or decreasing age-standardized incidence, the number of cases in British Columbia is increasing due to population growth and aging. Breast cancer operations in BC increased 28% between 2012 and 2022,2 and the number of breast cancer cases is projected to increase 52% between 2012 and 2030.3 Breast cancer care is an interdisciplinary endeavor involving family

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This article has been peer reviewed.

physicians, general surgeons, radiologists, pathologists, medical oncologists, and radiation oncologists, plus other allied health workers. With the increasing trend in the use of neoadjuvant chemotherapy before surgery in up to 15% of breast cancer cases, multidisciplinary cancer conference discussions are also increasingly required.4

The diagnostic pathway for breast cancer is complicated and fraught with delays, as shown in the Breast Health Action Plan developed in BC in 2010 [Figure 1].⁵ The interdisciplinary nature of breast cancer care also leads to silos of care, where groups of physicians focus on their area of specialty with limited coordination with

other groups. Without feedback from all physicians involved throughout the entire journey, overall wait times increase.

National benchmarks

According to the pan-Canadian standards for breast cancer surgery,6 the benchmark wait time from abnormal breast imaging or

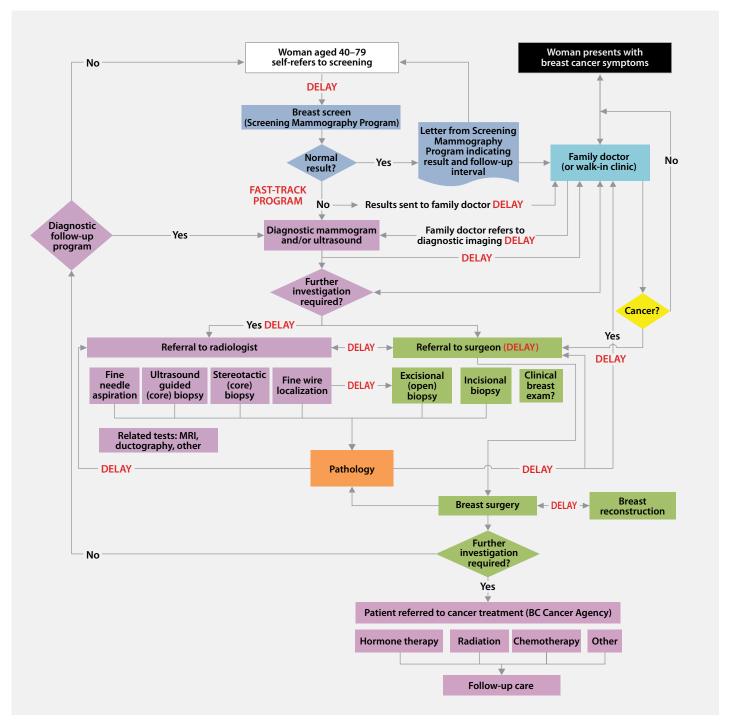


FIGURE 1. The diagnostic pathway for breast cancer.5

clinically suspicious finding to diagnosis is 42 days; core biopsy pathology should be reported within 7 days; biomarker results should be reported "in a timely manner"; surgical consultation should occur within 14 days of referral; final pathology should be reported within 14 days; surgery, chemotherapy, and/or radiation therapy should be initiated within 28 days of oncology consultation; and adjuvant chemotherapy should be initiated within 84 days of surgery. Twenty-one days from abnormal screen or symptomatic presentation to diagnostic result has also been proposed.⁷

According to Health Canada's Quality Determinants of Organized Breast Cancer Screening Programs in Canada, the time from abnormal screening to first assessment should be 21 days, the time from first assessment to diagnosis should be 28 days, and total duration from abnormal screening to diagnosis should be 49 days.8 The benchmark for referral to radiation oncology consultation is 28 days.9 According to the head of BC Cancer, 10 the benchmarks for referral to medical oncology consultation and for radiation oncology consultation to radiotherapy initiation are also 28 days. Therefore, the wait time from referral to chemotherapy or radiotherapy should be 56 days (28 + 28 days). These are the benchmark standards we used in our comparisons [Table 1].

Objective

Our objective was to quantify wait times across the continuum of interdisciplinary breast cancer care, identify causes of delays, and propose solutions to shorten the overall time from diagnosis to treatment of breast cancer at our hospital.

Methods

This quality improvement project was screened for ethics using the ARECCI tool¹¹ and deemed low-risk; therefore, it did not require a formal ethics review.

We included all patients who were diagnosed with invasive breast carcinoma, ductal carcinoma in situ, or phyllodes tumors of the breast and referred to the general

TABLE 1. Diagnostic and treatment benchmarks.

Diagnostics	Benchmark
Abnormal screening (imaging or clinically suspicious finding) to diagnosis	42 days* 49 days†
Abnormal screening to diagnostic imaging	21 days†
Diagnostic imaging to biopsy	14 days†
Diagnostic imaging to diagnosis	28 days†
Biopsy reporting	7 days*
Biopsy to biomarker results	7 days¶
Final surgical pathology reporting	14 days*
Treatment	
Referral to surgical consultation	14 days*
Surgical consultation to surgery	28 days*
Referral to medical oncology consultation	28 days§
Referral to radiation oncology consultation	28 days‡
Oncology consultation to chemotherapy initiation	28 days§
Oncology consultation to radiotherapy initiation	28 days§
Referral to chemotherapy initiation	56 days§
Referral to radiotherapy initiation	56 days§
Surgery to adjuvant chemotherapy initiation	84 days*

^{*}Canadian Partnership Against Cancer;⁶ †Canadian National Breast Cancer Screening Strategy;⁸

surgery service at Vernon Jubilee Hospital (VJH), a 196-bed regional hospital in the Regional District of North Okanagan. We limited the comparison to the calendar years of 2013 and 2023. Cases of benign breast lesions were excluded.

Using a combination of family physician or surgeon office chart review and review of hospital and BC Cancer electronic records, the following dates were recorded: referral for breast imaging, screening mammogram, diagnostic mammogram, focused

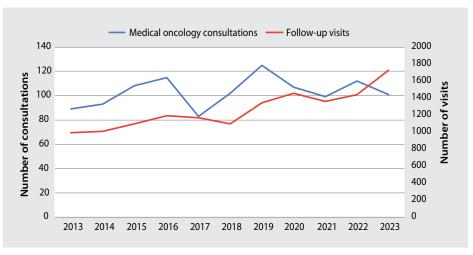


FIGURE 2. Breast cancer appointments with medical oncology at Vernon Jubilee Hospital, 2013–2023.

[‡]Canadian Institute for Health Information; ⁹ BC Cancer; ¹⁰ *Expert opinion of authors.

TABLE 2. Characteristics of breast cancer patients at Vernon Jubilee Hospital, 2013 versus 2023.

	2013 (n)	2023 (n)	P
Patients	69	113	
Pathology			
Ductal carcinoma	59	85	.13
Lobular carcinoma	3	9	.54
Mixed ductal/lobular carcinoma	1	1	1
Mucinous carcinoma	0	3	.29
Micropapillary carcinoma	0	1	.0
DCIS*	5	10	.79
Paget's disease of the nipple (aka Paget's disease of the breast)	1	0	.38
Phyllodes tumor	0	4	.30
Received palliation without surgery	2	3	1
Received neoadjuvant chemotherapy	3	13	.11
Biomarkers reported in non-useful time frame (after surgery date)	27/66	31/105	.14
Triple-negative or HER2†-positive	6	23	.039
Did not receive neoadjuvant chemotherapy	5	13	.36
Biomarkers reported in non-useful time frame (either less than 7 days before operating room date or any time after surgery)	3	6	1
Same- or next-day biopsy after diagnostic imaging	39	18	< .01

^{*}DCIS = ductal carcinoma in situ; †HER2 = human epidermal growth factor receptor 2.

ultrasonography, breast biopsy, reporting of biopsy pathology, reporting of biomarkers, referral to general surgeon, general surgeon consultation, surgery date, referral to cancer agency, medical oncology consultation, radiation oncology consultation, chemotherapy initiation, and radiotherapy initiation. We also noted whether patients required neoadjuvant chemotherapy, surgical procedure, and pathology diagnosis.

We used the two-tailed *t* test to compare continuous variables and the Fisher exact test to compare categorical variables using an online calculator. ¹² Confidence intervals were calculated using Microsoft Excel. A *P* value less than .05 was considered significant.

Results

The number of breast cancer cases referred to the general surgery group at VJH increased from 69 in 2013 to 113 in 2023 (64%). Figure 2 shows the number of

breast cancer appointments with medical oncology at VJH during this period. **Table 2** shows patient characteristics in 2013 versus 2023. **Table 3** summarizes the various wait times. The mean overall wait from initial imaging referral to surgery increased from 67 days in 2013 to 114 days in 2023 (P < .01). **Table 4** shows the benchmark wait times that were met and not met in 2013 versus 2023.6,8-10

Diagnostics

There were significant increases in diagnostic wait times from 2013 to 2023 [Table 4]. Many wait times that met benchmarks in 2013 no longer did so in 2023. In particular, patients who presented to their family physician with symptoms such as a palpable mass (family physician referral) experienced larger increases in wait times than patients without symptoms who were identified through the Screening Mammography Program.

The wait time from biopsy to final biomarker reporting did not increase significantly from 2013 to 2023, but it was already 25 days in 2013. In many cases, the final biomarker reporting was after the surgery date. **Table 2** shows that in both years, the biomarkers for several patients who were either triple-negative or HER2-positive and did not receive neoadjuvant chemotherapy were reported in a non-useful time frame (either less than 7 days before the surgery date or after the surgery date).

Wait-one time

Wait-one time is defined as the time from primary care referral to surgical consultation. It increased from 10 to 14 days from 2013 to 2023 but was not a significant increase [Table 3], and it met the benchmark of 14 days in both time periods [Table 4].

Wait-two time

Wait-two time is the time from surgical consultation to operation. It increased significantly from 17 to 31 days from 2013 to 2023 [Table 3]. The wait time met the benchmark in 2013 but failed to meet it in 2023 [Table 4].

Oncology referral and treatment

The wait time for referral to medical oncology consultation increased significantly from 14 to 30 days from 2013 to 2023 [Table 3], and in 2023, it failed to meet the 28-day benchmark [Table 4]. The wait time for referral to chemotherapy initiation did not increase significantly [Table 3] and met the benchmark in both periods [Table 4]. The wait from surgery to adjuvant chemotherapy did not increase significantly [Table 3] and met the benchmark in both periods [Table 4]. The wait time for medical oncology consultation to chemotherapy initiation decreased slightly but not significantly from 2013 to 2023 [Table 3] and met the benchmark in both periods [Table 4].

For patients who required neoadjuvant chemotherapy, the wait time from referral to the cancer agency for chemotherapy initiation increased from 18 days (n = 3,95%)

TABLE 3. Wait times for breast cancer diagnosis and treatment at Vernon Jubilee Hospital, 2013 versus 2023.

	2013 (n) 69		2023		P
Patients (n)			113		
	Mean no. days (n)	95% CI	Mean no. days (n)	95% CI	
Imaging referral to surgery	67 (63)	56-78	114 (93)	100-128	< .00001
Diagnostics					
Imaging referral to pathology diagnosis	36 (68)	29-43	71 (110)	60-82	.000017
Screening Mammography Program (SMP) mammogram to pathology diagnosis	40 (24)	31-49	58 (43)	45-71	.09
Family physician (FP) referral to pathology diagnosis	34 (44)	25-43	80 (67)	64-96	.000051
SMP mammogram to biopsy	36 (24)	28-44	54 (43)	41-57	.09
FP referral to biopsy	31 (44)	22-40	75 (67)	59-91	.000093
SMP mammogram to diagnostic imaging	22 (24)	15-29	24 (43)	15-33	.76
FP referral to diagnostic imaging	20 (44)	12-28	43 (67)	32-54	.0023
Diagnostic imaging to biopsy	12 (69)	8-16	31 (111)	24-38	.00031
Biopsy to pathology report	3.0 (69)	2.4-3.6	4.5 (112)	3.6-5.4	.019
Biopsy to biomarker report	25 (68)	21-29	29 (108)	24-34	.25
Surgery to final pathology reporting	11 (67)	9-13	17 (110)	15-19	< .00001
Wait-one time					
FP referral to general surgery consultation	10 (59)	7-13	14 (111)	11-17	.06
Wait-two time					
General surgery consultation to operation	17 (60)	14-20	31 (95)	27-35	< .00001
Oncology					
Referral to medical oncology consultation	14 (65)	10-18	30 (102)	25-30	.00017
Referral to chemotherapy initiation	37 (21)	28-46	44 (31)	36-52	.26
Surgery to adjuvant chemotherapy initiation	50 (18)	42-58	58 (19)	50-66	.15
Medical oncology consultation to chemotherapy initiation	25 (21)	18-32	19 (31)	14-24	.20
Referral to radiation oncology consultation	78 (37)	67-89	106 (73)	91-121	.025
Referral to radiotherapy initiation	114 (28)	95-133	143 (49)	122-165	.077
Radiation oncology consultation to radiotherapy initiation	43 (29)	31-65	28 (49)	20-36	.38

CI 8-28) to 27 days (n = 12,95% CI 22-32) but was not significant (P = .12) and met the 56-day benchmark in both periods.

The wait time for referral to radiation oncology consultation increased significantly from 2013 to 2023 but not for referral to radiotherapy initiation [Table 3]; however, the wait times for both failed to meet the benchmark in both years [Table 4]. The wait time from radiation oncology consultation to radiotherapy initiation decreased from 2013 to 2023 but not significantly [Table 3] and failed to meet the benchmark only in 2013 [Table 4].

Discussion

Wait times for both diagnosis and treatment of breast cancer at VJH increased significantly from 2013 to 2023, and several benchmarks that were met in 2013 were not met in 2023. The overall wait time from abnormal imaging to surgery increased from 67 days in 2013 to 114 days in 2023 and did not compare favorably to a median wait time of 52 days in Ontario for 2003 to 2011¹³ (Ontario data are not available for 2013 or 2023).

The 64% increase in breast cancer referrals to general surgery in our study was

higher than the 13% increase in new breast cancer medical oncology consultations from 2013 to 2023. It was also greater than the 28% increase in breast cancer operations conducted provincially between 2012 and 2022. This could be explained by the fact that some referrals from outside the Regional District of North Okanagan were diverted to other centres by the local medical oncology service due to a shortage of medical oncologists at VJH in 2023, while surgeons continued to accept out-of-region referrals. Additionally, in the North Okanagan and Columbia—Shuswap Regional

TABLE 4. National benchmarks met (green cells) or not met (orange cells), 2013 versus 2023.

	Benchmark	2013 (mean no. days)	2023 (mean no. days)	Change
Diagnostics				
Imaging referral to pathology diagnosis	42 days* 49 days†	36	71	97%
Screening Mammography Program (SMP) mammogram to pathology diagnosis	42 days* 49 days†	40	58	45%
Family physician (FP) referral to pathology diagnosis	42 days* 49 days†	34 80		135%
SMP mammogram to biopsy	35 days [†]	36	54	50%
FP referral to biopsy	35 days [†]	31	75	142%
SMP mammogram to diagnostic imaging	21 days†	22	24	9%
FP referral to diagnostic imaging	21 days†	20	43	115%
Diagnostic imaging to biopsy	14 days†	12	31	158%
Biopsy to pathology report	7 days*	3.0	4.5	50%
Biopsy to biomarker report	7 days¶	25	29	16%
Surgery to final pathology reporting	14 days*	11	17	55%
Wait-one time				
FP referral to general surgery consultation	14 days*	10	14	40%
Wait-two time				
General surgery consultation to operation	28 days*	17	31	82%
Oncology				
Referral to medical oncology consultation	28 days§	14	30	114%
Referral to chemotherapy initiation	56 days§	37	44	19%
Surgery to adjuvant chemotherapy initiation	84 days*	50	58	16%
Medical oncology consultation to chemotherapy initiation	28 days*	25	19	-24%
Referral to radiation oncology consultation	28 days‡	78	106	36%
Referral to radiotherapy initiation	56 days§	114	143	25%
Radiation oncology consultation to radiotherapy initiation	28 days*	43	28	-42%

^{*}Canadian Partnership Against Cancer, 6 † Canadian National Breast Cancer Screening Strategy, 8 † Canadian Institute for Health Information, 9

Districts, the population aged 65 years or older increased 43% between 2013 and 2023.14

Delays in imaging— A prominent contributor

Abnormalities are detected in 9.1% of screening mammograms, and 6.1% of those are diagnosed as cancer.¹⁵ Shorter wait times for diagnosis have been achieved by coordinating radiologic and clinical care16—for example, by adopting a policy of completing diagnostic workups without requiring new requisitions or keeping

dedicated rapid-access appointments for breast biopsy within a short period, such as less than 1 week. This might improve the rate of same- or next-day biopsies after abnormal diagnostic imaging, which declined significantly from 57% in 2013 to 16% in 2023 in our study. A possible factor in the decline in same-day biopsies was a shortage of radiologists at our hospital in 2023, which was not an issue in 2013. Without radiologists, image-guided biopsies cannot be performed; this applies not only to breast lesions but also to other organs that require tissue diagnosis. Improving radiologist

human resources should be a high priority in our health region.

Establishing a breast health clinic such as the one based in Kamloops¹⁷ and employing a nurse navigator18 can also reduce wait times, but this is dependent on additional funding. Strategies to reduce wait times for diagnostic imaging without obtaining additional funding could include a fast-track pathway for high-suspicion symptomatic patients.

The Screening Mammography Program has dedicated resources for monitoring wait times and other outcomes. There is

[§] BC Cancer;10 ¶ Expert opinion of authors.

no equivalent monitoring system for symptomatic patients who are referred by their family physician, which has likely led to the unintended discrepancy in wait times between the two groups in our study. There should be an annual audit of wait times for symptomatic patients to ensure outcomes are equivalent to those of Screening Mammography Program patients.

Biomarkers logistics— A major problem

Biomarkers, estrogen/progesterone, and HER2 receptors are crucial factors that impact clinical decision making. Delays in reporting lead to delays in surgery or oncology consultation. Sixteen percent of our patients had triple-negative or HER2-positive disease. Ideally, these cases should be discussed at multidisciplinary conferences and locally attended by general surgery, radiology, pathology, and oncology, and those with larger tumors or positive nodes should be considered for neoadjuvant chemotherapy before surgery.4 However, less than half the cases of potentially eligible patients in our study were discussed at multidisciplinary conferences, and the biomarkers of half those patients were reported either within 7 days of the operating room date or even after the surgery was completed. We believe biomarkers should be reported within 7 days of the biopsy, but this was not possible due to logistical issues. The testing was done only in Vancouver and required samples to be transported between centres. If immunohistochemistry interpreted the HER2 receptor as "equivocal," then in situ hybridization testing led to further delays. The results were reported on one system at BC Cancer, but they did not seamlessly transfer to the local health authority system. Therefore, workarounds were required, which were not consistent and led to triple-negative or HER2-positive status sometimes being discovered only after the surgery had been performed. It should be noted that although proportionally fewer patients underwent surgery in 2023 without having biomarker results available compared with those in 2013, this was not due to improved

biomarker reporting times. Rather, in many cases, surgery was delayed because the consensus at the multidisciplinary conference was that neoadjuvant chemotherapy might be necessary and dependent on the results. To reduce the turnaround time to acceptable levels, both immunohistochemistry and in situ hybridization testing of biomarkers should be performed within the region, either in Kelowna or locally in Vernon, and not in Vancouver. In addition, the attending surgeon should be identified through a centralized referral pathway so they can be copied on any biomarker result addenda to the original biopsy.

Lack of local pathology processing

There was a significant increase in the time from surgery to the final pathology results. This is also crucial information that impacts and delays adjuvant treatment. Processing of pathology specimens (embedding, cutting, and slide generation) is currently performed in Kelowna, though previously it was done locally in Vernon. This service should be re-established to reduce wait times and help expedite oncology treatments.

Operating room access below the provincial average

Delays from diagnosis to surgery can lead to increased mortality. ¹⁹ Though the wait time from referral to surgical consultation in our study did not increase significantly and remained within benchmarks in both years, shorter wait times to surgery have been achieved with centralization of surgical referrals. ²⁰ This should be implemented at VJH to equalize surgical wait times.

The 2021 median wait time for breast cancer surgery in Canada was 18 days. The 17-day mean and 15-day median surgical wait times in 2013 in our study compared favorably with this, but the 31-day mean and 28-day median wait times in 2023 did not. The 82% increase in mean wait time from general surgery consultation to operation in our hospital could be explained by a relative shortage of operating room access compared with the rest of BC. While breast cancer cases increased 64% from 2013 to

2023 in our study, operating room time for the general surgery service increased only 10%, from 20 to 22 operating room days per month. The mean number of operating room days per surgeon per month in our study was 4.0 (20 days/5 surgeons) in 2013 and 3.1 (22 days/7 surgeons) in 2023; the mean in BC was 4.2 in 2022.² Increasing operating room access to match the provincial average would require an additional 7.5 operating room days per month, which would help reduce wait times.

Extreme oncology human resource challenges

Once patients saw either a medical or radiation oncologist, their treatment initiation was very prompt and was even significantly reduced for radiotherapy in 2023 compared with 2013. However, the wait time to see a medical oncologist more than doubled from 2013 to 2023. In some instances, the delays were due to biomarker reporting times or those for Oncotype DX results, genetic tests on the breast tumor that are performed in California; however, this was not the major factor. Most delays to see a medical oncologist were due to human resource shortages at our local BC Cancer clinic. In 2023, many patients were diverted to other centres in the region, which had resource challenges of their own.

Waiting more than 84 days for radiotherapy has been associated with poorer outcomes.²¹ In our study, the wait time for radiotherapy was already unacceptably long in 2013 (114 days), greater than the 56-day benchmark, but then increased even more to 143 days in 2023 (25%). This also points to a major shortage in human resources; the wait times will continue to worsen unless this shortage is addressed. We estimate that three times the number of current medical and radiation oncologists in the region are needed to handle the current demand.

Study limitations

This project was limited to key dates along the breast cancer care continuum and did not delve into individual reasons for delays, such as those due to patient reluctance

toward investigation or treatment. It also shows wait times only at VJH, though we believe the results are generalizable to other facilities throughout the province because many of the issues we identified are systemic and not limited to VJH. Another important limiting factor was the severe shortage of primary care physicians and the associated impact on patients without a family doctor who had limited access to the Screening Mammography Program or investigation of a new breast lump. Additionally, the wait time from self-referral to screening mammography was unknown, because these data were not available.

Conclusions

Treating breast cancer is an interdisciplinary endeavor, but this is a source of weakness, because delays among the various independently functioning components along the care continuum contribute to overall increasing wait times. Our study showed that the wait times from referral to surgery increased from 67 days in 2013 to 114 days in 2023 (70%), the wait from referral to radiotherapy increased from 114 to 143 days in the same period, and extremely slow biomarker reporting compounded delays. An interdisciplinary approach to each component of the delay is necessary to improve patient outcomes. The Box lists our recommendations for improving wait times for each component along the continuum of care for breast cancer patients at VJH. ■

Funding

This project was funded by the Vernon Jubilee Hospital Physician Society, a branch of the Specialist Services Committee's Facility Engagement Initiative.

Competing interests

None declared.

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BOX. Recommendations for improving wait times for breast cancer diagnosis and treatment at Vernon Jubilee Hospital.

Diagnostics:

- · Complete imaging workup without requiring new requisitions.
- Keep dedicated rapid-access appointments for image-guided biopsy within 1 week.
- Establish a fast-track pathway for highsuspicion symptomatic patients.
- Perform annual audits of imaging wait times for symptomatic patients to ensure outcomes are equivalent to those for Screening Mammography Program patients.
- · Perform biomarker testing within the
- Identify attending surgeons early through a centralized referral pathway so they can be copied on biomarker results.
- · Re-establish pathology slide processing locally.

Wait-one time:

· Establish centralized referral for surgical consultation.

Wait-two time:

Increase operating room time for the Vernon Jubilee Hospital general surgery service by 7.5 days per month to meet the provincial average of 4.2 operating room days per surgeon per month.

- Triple the number of medical and radiation oncologists in the region.
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