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Coordination of radiologic and clinical care reduces the wait time to breast cancer diagnosis

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ABSTRACT

Background In 2009, a Rapid Access Breast Clinic (RABC) was opened at our urban hospital. Compared with the traditional system (TS), the navigated care through the clinic was associated with a significantly shorter time to surgical consultation. Since 2009, many radiology facilities have introduced facilitated-care pathways for patients with breast pathology. Our objective was to determine if that change in diagnostic imaging pathways had eliminated the advantage in time to care previously shown for the RABC.

Methods All patients seen in the RABC and the office-based TS in November–December 2012 were included in the analysis. A retrospective chart review tabulated demographic, surgeon, pathology, and radiologic data, including time intervals to care for all patients. The results were compared with data from 2009.

Results In 2012, time from presentation to surgical consultation was less for the RABC group than for the TS group (36 days vs. 73 days, $p < 0.001$) for both malignant (31 days vs. 55 days, $p = 0.008$) and benign diagnoses (43 days vs. 79 days, $p < 0.001$). Comparing the 2012 results with results from 2009, a decline in mean wait time was observed for the TS group (86 days vs. 73 days, $p = 0.02$). Compared with patients having investigations in the TS, RABC patients with cancer were more likely to undergo surgery within 60 days of presentation (33% vs. 15%, $p = 0.04$).

Conclusions The coordination of radiology and clinical care reduces wait times for diagnosis and surgery in breast cancer. To achieve recommended targets, we recommend implementation of more systematic coordination of care for a breast cancer diagnosis and of navigation to surgeons for patients needing surgical care.

Key Words Breast cancer, wait times, diagnosis, surgery, delivery of care

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INTRODUCTION

Studies have reported varying results for the effect of diagnostic and treatment wait times on breast cancer (BCa) outcomes[1–3]. Systematic reviews have suggested that a benefit accrues from shortening wait times, and their conclusions recommend minimizing delays to diagnosis and treatment. The reviews are not able to define the time at which a delay becomes clinically relevant[4,5], but a recent study by Bleicher *et al.*[1] showed decreased survival with a time of more than 60 days from diagnosis to surgery.

In British Columbia and the rest of Canada, increasing waits for diagnosis and treatment of BCa have been reported[6–12]. In 2013, 66% of patients in British Columbia needing a core biopsy after an abnormal mammogram underwent biopsy within 49 days. At that point, the wait time in all Canadian provinces except Prince Edward Island was shorter[13]. In 2013 in British Columbia, 90% of BCa surgery was performed within 39 days, similar to the national average, in which 90% of surgeries were performed within 42 days[14].

In Europe, guidelines from the European Society of Mastology recommend 21-day targets from presentation to diagnosis and from diagnosis to surgery[15]. To address wait-time concerns, many Canadian provinces are introducing care pathways and navigated care[14,16–20]. Those programs

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have targets from presentation to diagnosis (core biopsy) of 21–30 days and targets from core biopsy to surgery of 21–30 days.

In 2012, the B.C. Provincial Breast Health Strategy recommended a target for British Columbia of 28 days from presentation to core biopsy[21], and the current target for BCA surgery in British Columbia is 28 days from the decision to operate to surgery[22].

Beginning in 2010, to address delays in British Columbia, the B.C. Screening Mammography Program offered a fast-track booking program to all screening patients with an abnormal finding. That program proved successful in reducing wait times when first offered in 1999[23]. In 2009, the Rapid Access Breast Clinic (RABC) was established at Mount Saint Joseph Hospital, Vancouver. The RABC used a navigated-care model to reduce time to surgical consultation, coordinating all aspects of diagnosis and treatment at one facility[24]. In addition, many breast diagnostic radiology facilities in the greater Vancouver area adopted a policy, after abnormal breast investigations, of completing a diagnostic work-up without requiring additional requisitions, hereafter called "facilitated radiology booking."

The objective of the present study was to determine whether the navigated-care model of the RABC improved wait times compared with usual care after the introduction of facilitated radiology booking and fast-track screening mammography.

METHODS

All diagnostic, demographic, and operative data between November and December 2012 at Mount Saint Joseph Hospital were collected for analysis. Information for patients seen in their private offices by surgeons ["traditional system" (TS)] was obtained by chart review. Approval for the study was obtained from the University of British Columbia–Providence Health Care Ethics Review Board.

The RABC approach was to coordinate radiologic and clinical evaluation of all patients, facilitated by clerical and nurse navigation[24]. Clerks at the RABC facilitate movement of patients along clinical pathways under the supervision of the clinic physicians, surgeons, and radiologists; all patients needing core biopsy are called by a nurse navigator. All patients in the RABC are seen for physical exam and correlation of exam–imaging–pathology by the RABC family physicians, and patients are referred to a surgeon, if necessary. The RABC radiologist conducts triage based on the information in the referral form.

In contrast, patients receiving TS care have their investigations arranged by their family physician, and each diagnostic test requires an additional requisition. Patients are then referred for surgical consultation as deemed appropriate. With the introduction of facilitated radiology booking, patients attending those particular centres would undergo additional diagnostic imaging investigations with or without image-guided core biopsy, as appropriate, without requiring additional requisitions. Triage in the surgeon's office is conducted by the surgeon, based on information in the referral.

Figure 1 shows the two diagnostic pathways.

The pathway of care (RABC vs. TS) was determined by diagnostic imaging referral from the family physician. Only patients whose diagnostic work-up was performed by Mount Saint Joseph Hospital radiology were seen in the RABC clinic and were included in the RABC group. Patients whose investigations were performed elsewhere were seen in the surgeon's private office and were managed in the TS pathway and assigned to the TS group for analysis. Patients requiring surgery were added to their respective surgeon's wait list once diagnostic work-up was complete and a decision for surgery had been made. They were added to the wait list in sequence, with no preference for RABC or TS.

Only patients presenting with a new breast problem were included in the study. Patients presenting for a second opinion, follow-up patients, patients with chronic breast conditions, and patients who had previously been assessed by the breast surgeon were excluded. Patients with excessive wait times (>200 days) unrelated to access to the clinic or to diagnostics were excluded.

The months of November and December 2012 were selected for the study because results for that period could be compared with results for the same period in our previous study (November and December 2009)[24] to further assess the effects of facilitated radiology booking.

The primary endpoint of the study was time from presentation to surgical consultation. Secondary endpoints were the times from presentation to imaging, from imaging to core biopsy, from core biopsy to surgical consultation, and from surgical consultation to operation. Statistical analyses used the chi-square test for categorical variables and the Student t-test for continuous variables. Significance was set at $p < 0.05$.

RESULTS

Of the 349 patients seen for surgical consultation in November and December 2012, 176 had presented with a new breast problem and were included in the study. Of those 176 patients, 45 were referred to the surgeon with a diagnosis of cancer, and 9 more patients were diagnosed with cancer after investigation by the surgeon. The remaining 124 patients had benign conditions. Table I outlines the clinical presentations.

Figure 2 illustrates time from presentation to surgical consultation. Mean wait time from presentation to surgical consultation was significantly longer in the TS pathway (73 days vs. 36 days, $p < 0.001$). Wait times were consistently shorter in the RABC group for patients both with benign disease (79 days vs. 43 days, $p < 0.001$) and with malignancy (55 days vs. 31 days, $p = 0.008$). The maximum wait time to surgical consultation for BCA patients in the RABC was 49 days (range: 16–49 days); 50% of the TS patients waited longer (range: 12–184 days). For patients presenting through the screening mammography program, time from an abnormal screen to surgical consultation was 72 days for the TS group and 40 days for the RABC group, $p = 0.092$.

When the foregoing 2012 results were compared with the results from 2009, the mean wait time in the TS group was observed to decline (86 days vs. 73 days, $p = 0.02$), although the wait time for TS patients with a cancer

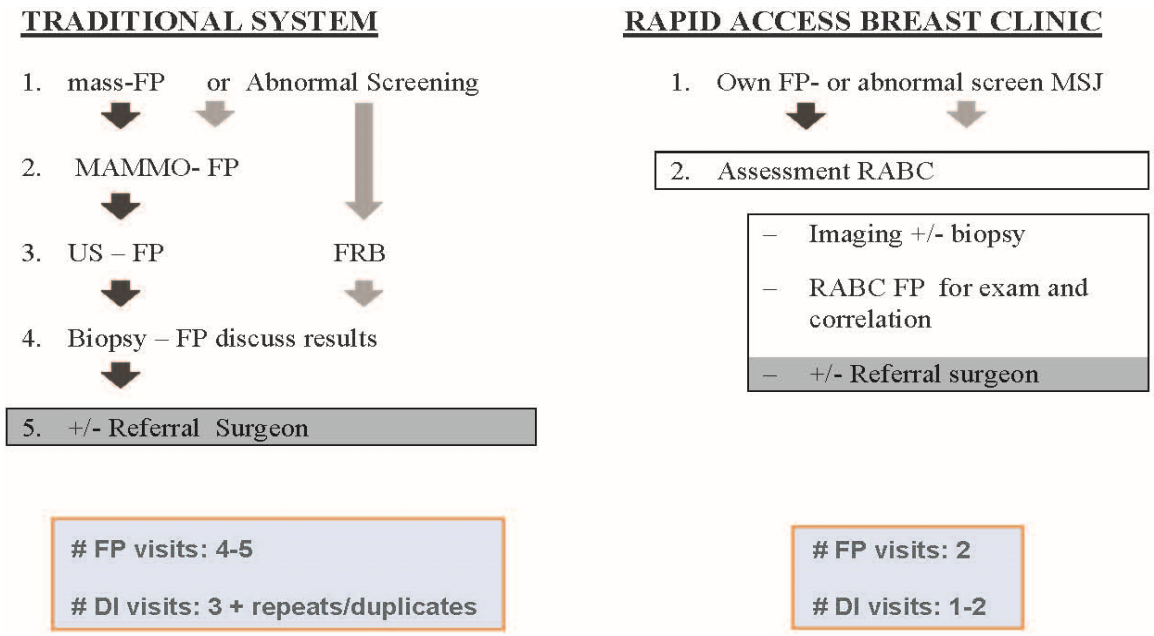

FIGURE 1 Diagnostic pathways for patient care in the traditional system or at the rapid access breast clinic (RABC). FP = family physician; MSJ = Mount Saint Joseph Hospital; MAMMO = mammography; US = ultrasonography; FRB = facilitated radiology booking; DI = diagnostic imaging.

TABLE I Clinical presentation at referral for study patients seen by the surgeon in the traditional system and at the rapid access breast clinic

Presentation	Patient group [*n* (%)]			
	Traditional system		Rapid access breast clinic	
	Overall (*n*=136)	With cancer (*n*=32)	Overall (*n*=40)	With cancer (*n*=13)
Abnormal screening mammogram	55 (41)	17 IC, 4 DCIS (66)	7 (18)	1 IC, 2 DCIS (27)
Abnormal follow up imaging	2 (1)	0	0	
Mass	39 (29)	8 IC (25)	22 (55)	9 IC, 1 DCIS (73)
Cyst	2 (1)	0	0	
Nipple discharge	12 (9)	1 IC (3)	6 (15)	
Breast pain	18 (13)	0	3 (8)	
Breast change	7 (5)	2 IC (6)	1 (3)	
Breast abscess	1 (1)	0	1 (3)	
Upgrade to cancer after seeing surgeon	9		0	

IC = invasive carcinoma; DCIS = ductal carcinoma *in situ*.

diagnosis was similar in both periods (59 days vs. 55 days, $p = 0.64$). When patients seen in the TS in 2012 were divided into those undergoing imaging at a facilitated radiology booking centre or a centre without that service, time to surgical consultation was shorter for those being seen at centres offering facilitated radiology booking (80 days vs. 117 days, $p = 0.007$). Furthermore, the number of patients in the TS group who were upstaged to cancer after seeing the surgeon declined to 8% in 2012 from 13% in 2009 ($p = 0.02$).

Figure 3 outlines patient wait times from presentation to surgery for all patients. For patients seen in the RABC, wait times were shorter from presentation to imaging (9 days vs. 28 days, $p = 0.007$), from imaging to core biopsy (10 days vs. 32 days, $p = 0.002$), and from core biopsy to surgical consultation (23 days vs. 39 days, $p = 0.028$). No difference was observed in the time from surgical consultation to surgery (26 days vs. 29 days, $p = 0.24$). Patients seen in the RABC were more likely to undergo surgery within 60 days of presentation ($p = 0.04$).

Of the 45 cancer patients seen during the study period, 36 had surgery as their initial treatment. Of those 36 patients, 7 (19%) had surgery within 60 days of presentation (15% TS vs. 33% RABC), and 29 (81%) waited more than 60 days from presentation (85% TS vs. 67% RABC). Of 9 patients (25%) who waited more than 90 days from presentation to surgery, all were in the TS group. Overall, 75% of patients

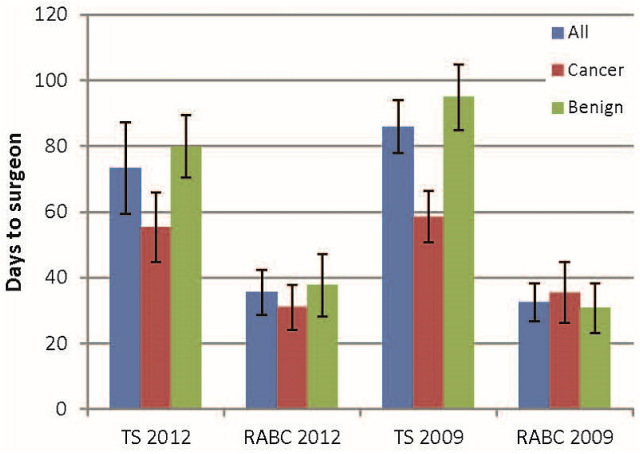

FIGURE 2 Time from presentation to surgical consultation for patients seen in the traditional system (TS) or at the rapid access breast clinic (RABC). Bars represent mean values, and whiskers represent the 95% confidence intervals (CIs).

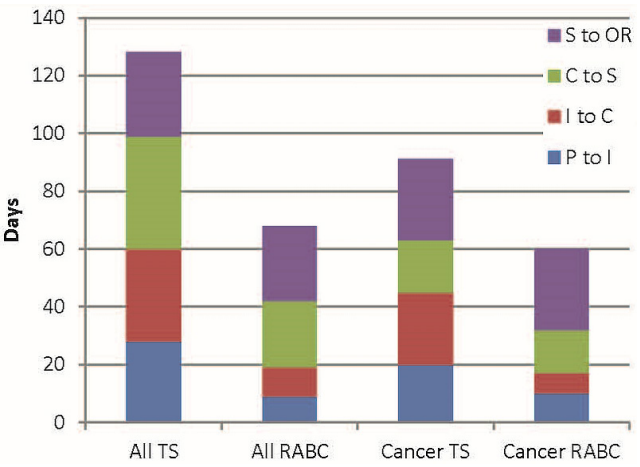

FIGURE 3 Wait times for all patients and for patients with cancer seen in the traditional system (TS) or at the rapid access breast clinic (RABC). All patients progressing to the next step in the pathway were included in the relevant steps, with the exception of surgical times for patients having neoadjuvant chemotherapy. S = surgical consultation; OR = surgery; C = core biopsy; I = first imaging; P = presentation.

underwent surgery within 60 days of core biopsy (78% TS vs. 66% RABC, $p = 0.33$).

DISCUSSION

The present study shows that many patients in our study population had wait times to diagnosis and treatment of BCA that exceeded the targets currently recommended in Europe and other parts of Canada. With the introduction of fast-track booking by the Screening Mammography Program and facilitated radiologic booking at some centres, improvements in diagnostic wait times have been made since 2009. However, at our centre, those improvements still underperformed the comprehensive navigated-care pathway.

The importance of wait time to surgery with respect to BCA survival is controversial, and the threshold of a safe wait time is not clear. In contrast, it is accepted that delays to adjuvant therapy can reduce survival[25,26]. Some recent studies have shown benefits for decreased wait times to surgery[1,2], but other studies have contradicted those results[3]. Yoo *et al.*[3] reported that delay in treatment initiation did not adversely affect survival in BCA, but their study looked only at a time to surgery of up to 60 days.

Bleicher *et al.*[1] looked at time to surgery in the U.S. Surveillance, Epidemiology, and End Results–Medicare linked database and the U.S. National Cancer Database. They found that a longer time to surgery is associated with lower overall and disease-specific survival, and that a shortened delay is associated with benefits comparable to therapies such as extended hormone therapy. The authors demonstrated a decrease of 2%–4% in adjusted overall survival at time-to-surgery waits of more than 60 days and recommended that strategies be developed to ensure that patients meet the 60-day target. In our study, 25% of patients had their surgery more than 60 days after core biopsy, with 81% of cancer patients waiting more than 60 days, and 25% of them waiting more than 90 days from presentation to surgery. Those patients might experience long-term consequences related to their prolonged waits.

To study the effects of navigated care and facilitated radiology booking, we evaluated patients seen in 2012 because, at that time, two separate diagnostic pathways were in use. The RABC was developed as part of a strategy to reduce wait times and streamline care. The patient-focused funding model that was used when the RABC was developed was discontinued after 2012[27]. Because of budget silos, the RABC program was transformed into the Providence Breast Centre, with resultant reduced staffing and decreased navigation. In 2012, the Provincial Breast Health Strategy report recommended navigated diagnostic pathways, but for multiple reasons, such pathways have not yet been implemented in British Columbia[21]. Surgical and diagnostic wait times for BCA continue to exceed targets at many centres in British Columbia[13,22].

Patient navigation is recommended in the guidelines for breast centres in the United Kingdom[26], Europe[15], and the United States[28]. Studies looking at the use of nurse navigation have shown improved patient satisfaction[29], better adherence to quality care indicators[30,31], decreased wait times[8,31,32], and cost effectiveness[33]. Nurse navigators are being used in a number of Canadian provinces to facilitate patient care and are working in some centres in British Columbia[8]. Although nurse navigation is the navigation type most commonly discussed in the literature, navigation that occurs at the clerical level (with clerks facilitating patient movement along clinical pathways under physician direction) can also be very effective; most of the navigation for diagnosis in the RABC is handled by the clerical team. Part of the success in reducing the time to surgical consultation in the RABC has arisen because clinic family physicians handle the initial clinical assessment and correlation as part of the navigated pathways.

As in the United Kingdom and Europe, programs in Alberta, Saskatchewan, Manitoba, and Ontario are recommending wait time targets of 21–30 days from presentation

to diagnosis and from diagnosis to surgery[16,18–20]. Patients in the present study who were managed at the RABC had mean wait times within those targets, but mean times for patients managed in the TS were not meeting the targets.

One of the limitations of the present study was the choice of the primary endpoint: time from presentation to surgeon visit. The endpoint of seeing the surgeon was chosen because it was the common event in the two diagnostic pathways; after seeing the surgeon, patients were combined on a single surgical wait list. Some patients would have seen the surgeon to complete their diagnostic work-up, which underestimates the diagnostic time. For other patients, the date of presentation was difficult to determine and might have either overestimated or underestimated the diagnostic time for the TS group. The date of first imaging or the date recorded by the surgeon or radiologist as the onset of the problem was used as the start date in the TS group. The RABC database records the date of patient referral, which was used as the start date for those patients.

Navigation through the breast diagnostic system in British Columbia is currently happening in a number of different ways for patients. Programs such as the RABC have used clerical and nurse navigation, combined with treatment algorithms, to reduce wait times. Some radiology centres have introduced facilitated radiology booking, primarily with clerical navigation, which has reduced diagnostic wait times. Patients in the Screening Mammography Program are fast-tracked and navigated to their first diagnostic imaging investigation. Individual family doctors, radiologists, and surgeons have also worked hard to improve movement of their patients through the diagnostic and treatment systems—resulting in some of the rapid diagnostic times seen in the TS. However, most patients in the present study experienced diagnostic wait times that exceeded targets and so would benefit from coordination of care.

Concern has been raised about the cost of coordinated care. To continue funding the RABC, the Health Services Purchasing Organization (B.C. Ministry of Health) requested a costing study of the RABC in 2011. That study demonstrated cost savings for the RABC compared with usual care[24].

Systematic improvement in wait times for BCA diagnosis and surgery will have to address issues of capacity (radiology and operating room time), coordination of radiology and clinical care, and coordination between various centres to offer patients the earliest available appointments. The benefits of the coordinated care model in the RABC are robust over time despite a number of initiatives to enhance traditional pathways.

CONCLUSIONS

The present study shows shorter wait times from presentation to diagnosis and from presentation to surgery in the RABC compared with the TS even after the improvements realized from facilitated radiology booking. The coordinated care in the RABC increases the number of patients undergoing diagnostic evaluation and surgery within recommended wait time targets. We therefore recommend that more systematic navigation be introduced for patients having breast diagnostic imaging and that navigation to surgeons be implemented for patients who require surgical care in our province.

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CONFLICT OF INTEREST DISCLOSURES

We have read and understood *Current Oncology*'s policy on disclosing conflicts of interest, and we declare that we have none.

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