



Breast Health Action Plan

Provincial Health Services Authority

February 28, 2010

Revised October 7, 2010

Table of Contents

EXECUTIVE SUMMARY	2
The Current State	2
Improving the System	3
1 INTRODUCTION	4
2 THE CURRENT STATE	5
2.1 THE SCREENING MAMMOGRAPHY PROGRAM OF BC	5
2.1.1 Performance of the System	5
2.1.2 Current SMPBC Strategies.....	7
2.1.3 The Population Screened.....	9
2.1.4 Hard to Reach Populations.....	10
2.1.5 Mammography Equipment in Screening Centres	10
2.1.6 Integration of Screening & Diagnostic Services.....	11
2.2 THE DIAGNOSTIC PATHWAY	11
2.2.1 Diagnostic Delays	13
2.2.2 Accreditation	13
2.2.3 Breast Health Centres.....	13
2.2.4 Navigation & Support	13
2.2.5 Surgery	14
2.2.6 Pathology.....	14
2.2.7 Mammography Equipment in Diagnostic Centres	15
2.2.8 Workforce Issues.....	15
3 THE FUTURE	16
3.1.1 Experiences in other Jurisdictions.....	17
3.1.2 A Provincial Approach.....	18
3.1.3 Primary Prevention.....	18
4 STRATEGIES TO IMPROVE THE SYSTEM	19
Objectives & Milestones	19

Executive Summary

Breast cancer is the most common type of cancer diagnosed in Canadian women, affecting one in every nine women at some point in their lifetime. There were over 2,800 new cases of breast cancer diagnosed in BC in 2009 and 650 women died from the disease.

While the benefits of breast cancer screening are still being debated, evidence suggests that organized screening mammography programs contribute to reductions in breast cancer mortality. Early detection through programmatic screening combined with effective treatment remains the best option available to continue to reduce the incidence of death due to breast cancer in women.

Breast cancer screening in BC is funded and coordinated by the Screening Mammography Program of BC (SMPBC). SMPBC contracts with Health Authorities (HAs) and Community (private) Imaging Clinics (CICs) to deliver screening services to women aged 40–79 through hospital, community, and mobile clinics.

Approximately 7% of women who are screened for breast cancer will require follow-up services at a diagnostic centre. These centres offer mammography, ultrasound, clinical breast exams, image guided core biopsies, and other procedures to rule out or to confirm a cancer diagnosis. Diagnostic services are delivered by HAs and CICs and funded by the Medical Services Plan (MSP). Unlike with screening, there is no provincial or regional coordination of diagnostic services.

An effective breast cancer screening program requires high rates of coverage and timely follow-up of abnormal results. There are currently challenges in both of these areas. This Breast Health Action Plan (BHAP) summarizes existing challenges and it recommends strategies to address them, in order to improve the clinical pathway and to achieve the First Ministers' Meeting (FMM) screening participation target of 70% for women aged 50 – 69 by the year 2013.

The Current State

Screening

Information on the performance of the breast cancer system in BC is collected by SMPBC and reported to the Canadian Breast Cancer Screening Initiative (CBCSI), a program of the Public Health Agency of Canada (PHAC). Evaluation reports that are published every two years show how well each province performs in relation to national targets and to each other. Although BC has demonstrated above average performance for many years, we currently fall short of the national targets in participation rate, retention, abnormal call rate, diagnostic interval and benign to malignant open biopsy ratio.

The reasons for performance shortfalls are complex and multi-faceted. The low screening participation of women aged 50 – 69 appears to be partially related to unclear messages about screening and eligibility. We need to communicate more effectively with women by developing a clear screening policy, targeting public awareness campaigns to specific groups, and strengthening linkages with family physicians. Other factors that contribute to low screening

participation in certain groups of women include low socio-economic status, not having a regular medical doctor, being a smoker, being aboriginal or a recent immigrant, and being from an Asian country. It is important for us to understand the barriers that exist for these women and to develop innovative strategies that improve rates in “hard to reach” communities.

The SMPBC’s success in achieving national targets hinges on the implementation of up-to-date digital equipment and supporting infrastructure. The use of outdated analog machines and partial conversion to digital equipment has created inefficiencies and duplication in the system. It has also led to challenges with staff recruitment and retention and poor integration between screening and diagnostic services. Since 2007, digital mammography has changed from being an emerging clinical technology to being the standard for new equipment acquisition. The BHAP proposes a ten year capital plan to replace existing screening mammography equipment with new digital technology that is connected through an integrated clinical information system.

Diagnostic Services

Women who have an abnormality identified through screening are referred to the diagnostic system. This system is fragmented and confusing to navigate in BC. Many women describe it as a diagnostic “maze” characterized by inconsistencies and delays prior to resolution. In 2008, only two thirds of women with an abnormal screen received a diagnosis within 5 weeks (without biopsy) and less than half received a diagnosis within 7 weeks (with biopsy).

Factors that contribute to fragmentation include the lack of regional and provincial coordination of diagnostic services and integration with the SMPBC, lack of a clear clinical pathway, standards and performance measures, staffing challenges, issues related to the reimbursement of radiologists and aging diagnostic mammography equipment.

Strategies to improve the breast cancer diagnostic system in BC have tended to focus on the creation of Breast Health Centres/Rapid Access Centres and patient navigator programs. Although both are important components of a high quality provincial program, they are limited in their ability to address systemic change as independent units. The BHAP incorporates these initiatives into strategies that address the larger breast health system to ensure equal access to appropriate screening for all women.

Improving the System

In May 2010, we will establish a Provincial Steering Committee to create a vision for breast health in BC and oversee the implementation of the BHAP. This committee will form the foundation for shared leadership, planning, standard setting, information sharing and evaluation of provincial cancer screening initiatives.

Eventually, all women in BC will receive high quality, coordinated breast screening and diagnostic services. They will receive care from experienced breast health professionals using state of the art equipment and their results will be available the same day. Women diagnosed with breast cancer will be treated in a timely manner by interdisciplinary treatment teams in a supportive environment. BC will become recognized across the country and around the world as a “Centre of Excellence” for breast health.

1 Introduction

Breast cancer is the most common type of cancer diagnosed in Canadian women, affecting one in every nine women at some point in their lifetime. Moreover, it is the second most common cause of cancer-related deaths in women. In 2009, there were over 2,800 new cases of breast cancer diagnosed in BC and 650 women died from the disease. If age-standardized incidence rates remain constant, the annual incidence will increase to more than 4,350 by the year 2030.¹

Early detection of breast cancer through programmatic screening combined with effective treatment remains the best option available to continue to reduce the incidence of deaths from breast cancer in women.² A high quality screening program can decrease breast cancer mortality by 20-30% in women over age 50 when the screening coverage is at least 70%.³ A recent study in BC found a reduction in mortality of 40%.⁴

In BC, publicly funded screening mammography is coordinated by the Screening Mammography Program (SMPBC) and delivered through contracts with Health Authorities and Community (private) Imaging Clinics (CICs). In 2008, 286,853 women aged 40 - 79 were screened through SMPBC. In total, 7% (21,191) of participants were referred for further testing and 1,203 women were diagnosed with breast cancer (4.2 per 1,000 exams).

The responsibility of a screening program does not end with screening. We must ensure that the evaluation and assessment of abnormal results are undertaken in a timely manner, that a woman receives a firm diagnosis with a minimum number of interventions, and that she is reassured quickly when no significant problems are found. This is a challenge in BC because of the way that diagnostic services are funded and delivered.

Diagnostic services for breast cancer are performed by both public and private providers. HAs operate the public diagnostic centres which they fund through a combination of operational funds and Medical Services Plan (MSP) billings. Private radiologists own and operate CICs, which they fund through MSP billings (technical and professional fees). A small number of private providers have opted out of MSP and bill patients directly for breast imaging services. Unlike the SMPBC screening program, there is no provincial coordination of diagnostic services.

We recognize that there are difficulties in the system and the Provincial Health Services Authority (PHSA) is committed to working with our partners to improve breast health in BC. In this Action Plan, we identify issues in the system and recommend strategies to address them. The desired outcomes of the BHAP are to increase screening to meet the FMM participation target of 70% for women aged 50 to 69 and to develop a smooth clinical pathway for women with abnormal mammograms.

2 The Current State

2.1 The Screening Mammography Program of BC

There are 37 fixed and 3 mobile screening mammography units in BC. SMPBC does not manage these units directly; they contract with HAs and CICs to deliver services on their behalf. Currently HAs deliver 53% of the screens through 29 fixed clinics and CICs deliver 47% of the screens through 8 fixed and 3 mobile clinics. SMPBC pays for services on a “cost reimbursement” basis (a formula based approach). The capital and operating costs of the screening centres are borne by the SMPBC and the schedule of payments is established through a budget-setting process. Radiologists are paid by SMPBC for interpretations of screening mammograms on a fee-for-service (FFS) basis.

2.1.1 Performance of the System

SMPBC keeps diagnostic procedure data on 99% of screening mammograms with abnormal findings in BC. This information is submitted to the CBCSI and entered into the Canadian Breast Cancer Database (CBCDB). Evaluation reports are published every two years showing how each of the organized breast screening programs in Canada compares to national targets and to each other. BC currently falls short of the targets in participation rate, retention, abnormal call rate, diagnostic interval, and benign to malignant open biopsy ratio. *[Note: These indicators are currently being reviewed by the CBCSI].*

Table 1: BC Screening Performance Compared to National Standards for Ages 50 -69

Indicator	Definition	National Target (age 50-69)	BC (2008)
Participation Rate (1)	% of women who have a screening mammogram (calculated biennially) as a proportion of the eligible population	≥ 70% of the eligible population	50% (+ est. 9% MSP)
Retention Rate (2)	The estimated % of women who are rescreened within 30 months of their previous screen	≥ 75% rescreened within 30 months (initial screen) ≥ 90% rescreened within 30 months (subsequent screen)	55% 82%
Abnormal Call Rate (3)	% of women screened who are referred for further testing because of abnormalities found with a program screen	< 10% (initial screen) < 5% (rescreens)	16.2% 5.8%
Invasive Cancer Detection Rate (3)	# of women detected with invasive cancer during a screening episode per 1,000 women screened	> 5 per 1,000 on initial screen > 3 per 1,000 on rescreens	6.2 per 1,000 3.1 per 1,000

Indicator	Definition	National Target (age 50-69)	BC (2008)
In Situ Cancer Detection Rate (3)	# of women detected with ductal carcinoma in situ cancer (rather than invasive cancer) during a screening episode per 1,000 women screened	Surveillance and monitoring purposes only	1.9 per 1,000 1.2 per 1,000
Diagnostic Interval (5)	Total duration from abnormal screen to resolution of abnormal screen	≥ 90% within 5 weeks - no biopsy ≥ 90% within 7 weeks - biopsy	67.9% - 5 wks 39.6% - 7 wks
Positive Predictive Value (3)	Proportion of abnormal cases with completed follow-up found to have breast cancer (invasive or in situ) after diagnostic workup.	≥ 5% (initial screen) ≥ 6% (rescreen)	5.1% 7.4%
Benign Core Biopsy Rate (per 1000) (3)	Proportion of cases with complete follow-up that resulted in a benign core biopsy	Surveillance and monitoring purposes only	14.6 per 1000 3.4 per 1,000
Benign to Malignant Core Biopsy Ratio	Among core biopsies, the ratio of # of benign cases to the # of malignant cancer cases	Surveillance and monitoring purposes only	2.5:1 1.1:1
Benign Open Biopsy Rate (per 1000) (3)	Proportion of cases with complete follow-up that resulted in a benign open biopsy	Surveillance and monitoring purposes only	9.0 per 1,000 2.2 per 1,000
Benign to Malignant Open Biopsy Ratio (3)	Among open biopsies, the ratio of # of benign cases to the # of malignant cancer cases	≤ 1:1 open (initial and rescreen combined)	3.6:1 1.7:1
Invasive Cancer Tumour Size (4)	% of invasive cancers with tumour size of ≤ 10 mm in greatest diameter as determined by the best available evidence: 1) pathological, 2) radiological, 3) clinical	> 25% ≤ 10 mm > 50% ≤ 15 mm	36% 63%
Node Negative Rate in Cases of Invasive Cancer (4)	Proportion of invasive cancers in which the cancer has not invaded the lymph nodes	< 70% node positive	73%
Post-screen Detected Invasive Cancer Rate	# of women with a diagnosis of invasive breast cancer after a negative screening episode per 10,000 person-years at risk, within 12 AND 24 months of the screen date	< 6 per 10,000 person-years (within 12 months) < 12 per 10,000 person-years (within 24 months)	Not reported

NOTES: Screen years: (1) = 2007 & 2008, (2) = 2005-2007, (3) = 2008, (4) = 2007, (5) = 2009
Population data source: P.E.O.P.L.E. 33 population estimates (Aug 2008), BC STATS, BC Ministry of Labour and Citizens' Services SMP data extraction date: August 17, 2009.

REFERENCE: Report from the Evaluation Indicators Working Group: Guidelines for Monitoring Breast Screening Program Performance Second Edition. Health Canada 2007

2.1.2 Current SMPBC Strategies

The strategies that have been implemented by SMPBC in the past five years to address performance shortfalls are outlined in table 2. The most effective strategy has been the SMPBC “Fast Track” program. This program, which involves the direct referral of a woman with an abnormal screen to a diagnostic centre, has reduced the time between screening and follow-up diagnostic testing by an average of one week.⁵ It was initiated in 1999, however, participation was voluntary until January 2010 at which time it was made available to all patients in BC.

Table 2: SMPBC Strategies to Achieve National Benchmarks (2005-2010)

<u>Problem</u>	<u>Strategy</u>	<u>Outcome</u>
Limited Public Awareness	<ul style="list-style-type: none"> Introduced 1 FTE promotion position & integrated screening promotion into the role of BCCA Cancer Prevention Coordinators Developed new materials in different languages, a web-site, twitter site, radio & newspaper ads, customized materials/workshops for aboriginal women and established Community Grants Fund Evaluated and revised marketing approach to include new materials, broad distribution, local advocates & customized programs Proposed targeted recruitment of women 50 – 69 through personalized invitation. Request for Data Access made to the BC Ministry of Health Services (MoHS) (2009) 	<ul style="list-style-type: none"> SMPBC materials revised & new approaches implemented in 2009/10 Started implementation of 2010-13 marketing plan Access to data on women age 50+ has been requested from the MoHS to facilitate invitations to screening
Physicians’ partnerships and lack of clear messages to women	<ul style="list-style-type: none"> Conducted research on physician engagement outlined in the proposal entitled <i>Primary Care Physician* Education and Engagement in the Promotion of Recommended Cancer Screening in BC (2009)</i> 	<ul style="list-style-type: none"> SMPBC materials for physicians have been revised and a plan developed to work more effectively with GPs
Rapidly Aging Equipment	<ul style="list-style-type: none"> Submissions were developed by SMPBC each year (2005-2010) to request digital mammography to replace aging analog machines. SMPBC commissioned the following reports related to implementation of digital mammography: 	<ul style="list-style-type: none"> Submissions not previously approved

<u>Problem</u>	<u>Strategy</u>	<u>Outcome</u>
Human Resource Shortages	<ul style="list-style-type: none"> ➤ <i>Introducing Screening Mammography into BC's Screening Mammography Program (2006)</i> ➤ <i>Transition to Digital Mammography, Northern Health Authority, Assessment of Readiness to Adopt Digital Mammography (Feb 2009)</i> ➤ <i>A Strategy to Transition to Digital Mammography Final Report (May 2009)</i> ➤ <i>Review of Digital Screening Mammography Costs: Interim Cost (Jan 2010)</i> <ul style="list-style-type: none"> • SMPBC commissioned the following reports on the screening mammography workforce: <ul style="list-style-type: none"> ➤ <i>The Technologists Workforce Supporting BC's Breast Cancer Screening Targets: Recruitment & Retention (2007-10)</i> ➤ <i>A Screening Mammography Technologist Workforce in BC Report (Feb 2010)</i> 	<ul style="list-style-type: none"> • The SMPBC 2010 Workforce Report is expected to be finalized in the fall 2010
Limited capacity to meet growing population	<ul style="list-style-type: none"> • Business Case Submitted to Ministry of Health Services – <i>Achieving National Breast Screening Mammography Targets (August 2007)</i> 	<ul style="list-style-type: none"> • Received an increase in operational funding for women aged 50 – 69
Delays from Screening to Diagnosis	<ul style="list-style-type: none"> • SMPBC Fast Track Program • Targeted Booking System for Women 50 – 69 	<ul style="list-style-type: none"> • Fast Track implemented voluntarily in 1999 and made available to all women in BC in Jan 2010 • Target booking implemented
Updating of national breast screening indicators including participation	<ul style="list-style-type: none"> • Working with the CBCSI to update national performance indicators (including the participation metric) and ensure that all screening procedures are adequately captured in the national database 	<ul style="list-style-type: none"> • An update is expected to be released in May 2010

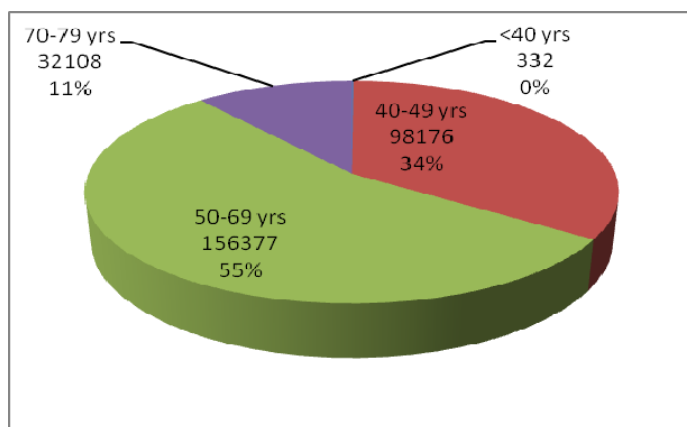
2.1.3 The Population Screened

The BC Cancer Agency (BCCA) Breast Tumor Group establishes screening policies and guidelines in BC. In 2009, this group conducted a review of the breast cancer screening policy taking into consideration the recommendations of the US Preventative Services Task Force (USPSTF). They concluded that women aged 40 – 79 should continue to be screened in BC. Using this guideline, the SMPBC has determined that women aged 40 – 49 years should be screened annually and women aged 50-79 should be screened every 2 years.

There is convincing evidence that screening mammography reduces breast cancer mortality, with a greater absolute reduction for women aged 50 – 74 years than for women aged 40 – 49 years or over 75⁶. On the other hand, there are harms resulting from screening that include psychological harms, unnecessary imaging tests and biopsies in women without cancer, and anxiety due to false-positive screening results.

World literature has been reviewed by expert panels and task forces in other countries that continue to have policies that limit regular screening mammography to women age 50 and up. A committee of experts in prevention, diagnosis and treatment will be convened to review the provincial policy on screening.. The first priority will be to address the screening policy for women aged 40 – 49 who currently use 34% of the services.

Figure 1: Screening Mammography Exams in BC (2008)



Screening of High Risk Women

In patients who have tested positive for mutations of the BRCA 1 and 2 genes, Magnetic Resonance Imaging (MRI) has been shown to detect cancers before mammography, ultrasound or clinical examination could detect malignancy. The BCCA Tumour Group currently recommends that high risk women receive annual MRIs at six months apart from annual mammography.⁷

MRI capacity is limited and the number of high risk women is expected to rise placing increased pressure on MRI waitlists. To understand the magnitude of this issue and plan for future capacity, the BC Cancer Agency (BCCA) will conduct a needs assessment and review screening recommendations to improve access to appropriate screening for this population.

2.1.4 Hard to Reach Populations

According to the 2008 Canadian Community Health Survey (CCHS), the main factors associated with non-use of screening mammography are low socio-economic status, not having a regular medical doctor, not having contacted a general practitioner (GP) or family doctor in the past year, and being a smoker. In addition, there is lower use among aboriginal women, recent immigrants and women born in Asia.⁸ This may reflect cultural sensitivities and differing attitudes about the mammogram procedure and its usefulness.

Screening rates vary across the province; women living in rural and remote communities have lower rates of screening than women in urban communities.⁹ In 2008, the screening uptake of women aged 50 – 69 ranged from a low of 34% in East Kootenay to a high of 55% in the Richmond.

There are a number of strategies that have been implemented by SMPBC to target “hard to reach” populations. These include updating marketing materials and translating them into several languages, adapting the routes of mobile units, implementing local advocate programs and initiating collaborative community development initiatives with HAs. These strategies will be reviewed, and combined with information on the determinants of compliance, in order to identify target populations for public health messaging. In addition, consideration will be given to developing a comprehensive social marketing campaign in collaboration with our partners in breast health.

To address the access problem experienced by women without a family physician, SMPBC has been working with walk-in clinics and surgeons to accept women into their practices for the purpose of screening. Although this has worked well in some communities, there are still gaps across the province. The current restructuring that is occurring in primary health care may provide opportunities to connect women with physicians through Integrated Health Networks (IHNs) and GP Divisions. In addition, the SMPBC Fast Track program has the potential to facilitate the acceptance of women without a physician into screening program and refer them to a physician at a later stage if they have an abnormality. SMPBC is working to resolve this issue quickly so that all women without a family physician can begin to access screening mammography in the near future.

2.1.5 Mammography Equipment in Screening Centres

The most significant problem facing SMPBC at this time is the aging mammography equipment and supporting information technology [i.e. Picture Archiving and Communication System (PACS), Radiology Information System (RIS) and a central Clinical (Screening) Information System (CIS)]. Many of the existing analog machines in screening centres are over ten years old and need to be replaced. Suppliers are no longer manufacturing analog machines and replacement parts are difficult to find. Radiology technologist training is no longer providing instruction in the use of analog mammography. Without updating the equipment, the program may not be sustainable, particularly as demand for screening increases. A report commissioned by SMPBC in May 2009 entitled “*A Strategy to Transition to Digital Mammography*” outlines the extent of the problem and recommends a strategy for replacement.

Of the 40 screening mammography machines in BC, only 7 are full-field digital (FFD). All of these are in the public sector -- 1 in Fraser Health Authority (FHA), 1 in Interior Health Authority (IHA) and 5 in Vancouver Island Health Authority (VIHA). There are 33 machines that need to be replaced over the next 3 years to maintain existing screening mammography services -- 18 of these are used exclusively for screening and 15 are used for both screening and diagnostic work. An overall strategy and business case will be developed to examine options for the replacement of the aging analog screening mammography machines with digital. There are an estimated 42 additional mammography machines in BC that are used exclusively for diagnostic work in HAs and CICs, the majority of which are still analog technology. This is discussed in more detail in Section 2.2.7.

2.1.6 Integration of Screening & Diagnostic Services

Screening and diagnostic services are not well integrated in BC due to different funding and operating arrangements. Even clinics that share equipment and space often function separately. It may be difficult to change this fragmentation in the short term; however, there are opportunities to more closely link and streamline services for patients through direct referral programs, advances in technology and shared accountability.

Implementation of the “Fast Track” program facilitates integration of screening and diagnostic services by creating direct referral pathways to diagnostic centres. This provides the opportunity for screening centres to refer women to high quality diagnostic services that have the equipment and expertise to perform a full range of breast diagnostic services, including image guided core biopsies.

In the future, increased integration could be accomplished through technological advances. For example improvements in image resolution might decrease duplication in mammography if an abnormality can be resolved using the screening image alone. In addition, integrated administrative systems may provide the opportunity to integrate patient registration and booking, reduce storage requirements, and facilitate file sharing.

2.2 The Diagnostic Pathway

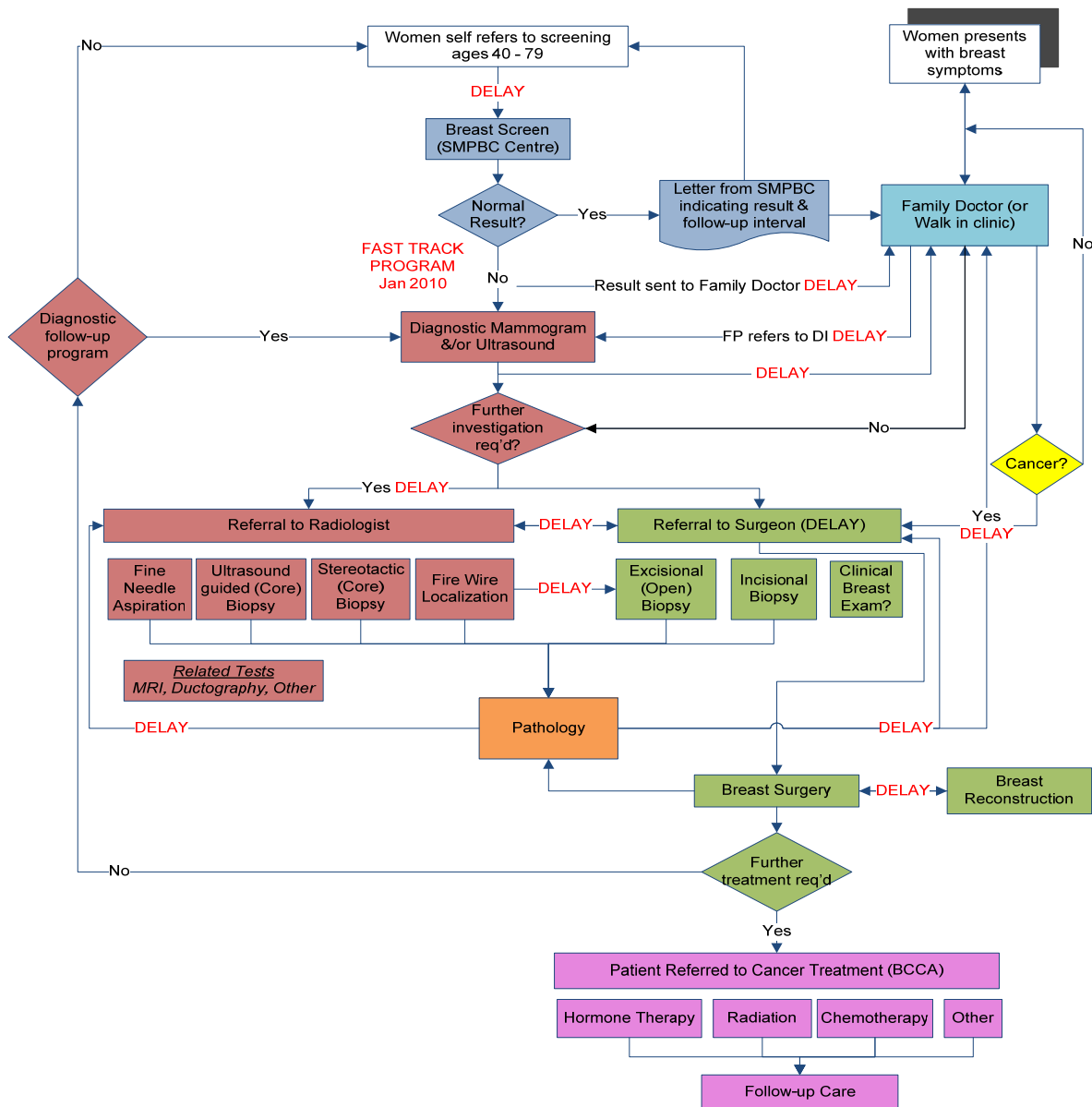
Diagnostic services in BC are provided by three types of centres as follows:

- 1) **Health Authority Diagnostic Imaging Clinics** – HAs own and operate these public clinics and employ the staff. Services are funded through technical and professional FFS billed to MSP. *[Note: BCCA and BCW Radiologists are employed by their organizations and paid salary. Other radiologists working in the public system are paid FFS for the work that they perform. Many of them also own and operate CICs.]*
- 2) **Community Diagnostic Imaging Clinics** – These clinics are owned and operated primarily by private Radiologists. They are funded by the MSP through technical and professional FFS and staff are employed by the community clinics.

- 3) **Private Diagnostic Imaging Clinics** –Services in these clinics are delivered by private radiologists that have opted out of MSP. They are funded by fees charged to patients. There are very few of these clinics in BC.

The diagnostic pathway involves a complex array of procedures that are performed by mammography technologists, ultrasonographers, general practitioners, nurses, radiologists, surgeons, and pathologists. The quality of work and time to diagnosis depends on where a woman lives, which medical professionals she is referred to, how well the professionals work together, and what facilities, equipment, and expertise is available in the area. The following flowchart illustrates the average patient’s journey and highlights where delays can occur in the diagnostic system.

Figure 2: The Diagnostic Pathway



2.2.1 Diagnostic Delays

The current Canadian standard for diagnostic interval is $\geq 90\%$ within 5 weeks (no biopsy) and $\geq 90\%$ within 7 weeks (tissue biopsy).¹⁰ BC intervals were 71.1% (no biopsy) and 43.6% (tissue biopsy) in 2008. These declined to 67.9% and 39.6% respectively in 2009 with a median wait time of 43 days from identification of abnormality to diagnosis.¹¹ Many people would argue that the national standards are not aggressive enough. European standards are 21 days to diagnosis and 30 days from abnormal screen or initial symptoms to surgery. If we set the standards higher in Canada, BC will be even more challenged to meet them.

We have highlighted the areas where delays occur in the pathway (Fig. 2) and have attempted to identify the factors that contribute to those delays throughout the plan. However, it is important to note that these factors are complex and interrelated and a provincial approach, that includes both public and private providers, will be necessary to truly affect changes in the system.

2.2.2 Accreditation

Screening centres are subject to high quality standards that are established and enforced, based on guidelines and recommendations from the Canadian Association of Radiologists (CAR), the PHAC, the Canadian Association of Medical Radiation Technologists (CAMRT), the BCCA Physics Support Group, and scientific literature. Outcome data is collected and analyzed on an ongoing basis to monitor program effectiveness and to identify areas for improvement.

Diagnostic centres are accredited by the Diagnostic Accreditation Program (DAP). Some centres have also obtained mammography accreditation through CAR. Many of the providers in the system felt that CAR-MAP accreditation should be required of all diagnostic centres that provide breast imaging. In addition, it has been suggested that the US-based breast imaging reporting system (BI-RADs) be adopted in BC.

2.2.3 Breast Health Centres

A number of Breast Health Centres/Rapid Access Centres have been established in BC over the past few years. Most of them are based on a model developed by the European Society for Breast Cancer Specialists (EUSOMA).¹² The services they provide range from triple assessment (diagnostic mammography and/or ultrasound, clinical breast exam, and image guided core biopsy) to surgical consultation and patient navigation/support. These centres have either been funded through HA operating funds or one time innovation funds, such as the Lower Mainland Innovation and Integration Fund (LMIIF).

Although initial results are promising, it will be important to evaluate these centres in the context of the larger breast health system in BC and to develop a provincial plan that will improve the system overall.

2.2.4 Navigation & Support

Navigator programs have been implemented in a few BC hospitals with positive results. Some exist within Breast Health Centres and others are standalone. Patient navigation has received a lot of attention in recent years as a way to streamline care and address gaps in service delivery.

Those who have implemented navigator programs report high levels of satisfaction and say that they have helped to remove barriers to care and to improve patient outcomes.

According to researchers, the navigator role is context-specific and can be filled by a variety of individuals, including nurses, social workers, peer supporters, and lay individuals.¹³ They can perform different roles in different settings, from support and navigation for patients to helping the health care team map out and redesign their processes. The latter function may be more sustainable as the navigator's role is to equip the team to improve the pathway and support patients themselves rather than become dependent on the navigator to do so. Northern Health Authority (NHA) has had success implementing this model.

No formal evaluation has been conducted in BC to determine the benefits of the navigator role, however, research is currently underway. This, combined with the experience of other provinces, will provide valuable information regarding the costs and benefits of navigators in breast health.

2.2.5 Surgery

The standard of care for the diagnosis of breast cancer is image-guided core biopsy.¹⁴ According to breast cancer experts, image guided core biopsies are less expensive than open biopsies and reduce unnecessary trauma.¹⁵ Despite this, over one third of all women in BC still have open biopsies performed by surgeons to diagnose an abnormality when a less invasive approach would be preferable.¹⁶ Reasons for this continued practice include: lack of capacity in many imaging clinics to perform biopsies, long wait times, unclear referral guidelines for family physicians, practitioner preferences, and other factors. The end result is a fragmented system that creates confusion, duplication, delays, and unnecessary surgical intervention and use of operating room time.

Ideally, surgeons should become involved when their expertise is required. With advances in imaging technology, this is usually after positive diagnosis has been made by image guided biopsy. Once a cancer is diagnosed, the interface with surgeons is very important. There should be a smooth transition from the diagnostic centre to the surgeon with minimal disruption and delays. There should also be good communication and consultation between interdisciplinary diagnostic teams, surgeons, and cancer treatment teams.

2.2.6 Pathology

To reduce delays in diagnosis, pathology results should be timely, with rigorous quality assurance. Although turn-around-time for pathology results has not been highlighted as a major problem in breast health, this area should be studied more closely and strategies developed to improve the speed of diagnosis and reporting. In addition, breast health teams should work to improve the communication between diagnostic teams and pathologists.

2.2.7 Mammography Equipment in Diagnostic Centres

There are approximately 42 mammography machines in BC that are used exclusively for diagnostic purposes. Over the past 2-3 years, HAs have been replacing their diagnostic analog equipment with digital, however, less than a third have been converted to date. The transition to digital has been slow due to the high cost of equipment and, in some cases, lack of a supportive information systems infrastructure. Where there have not been sufficient funds available, HAs have turned to their hospital foundations for funding or have built new equipment purchases into larger capital projects (such as the Surrey Outpatient Facility in Fraser Health Authority).

The majority of CICs that perform diagnostic services, continue to use analog mammography equipment due to the high cost of replacing it with digital. Although the MSP fee schedule technically covers the cost of equipment for diagnostic breast imaging services, radiologists contend that the cost of digital technology is higher than analog and that the fee schedule has not been updated to address this.

As diagnostic centres transition to digital use, the opportunities to integrate with screening and other diagnostic services increase substantially. With a supportive information system, centres will be able to share images and reports, book appointments across the system, and communicate with interdisciplinary team members using computers and tele-health technology. In addition, they will be able to collect and analyze data in real time and make quick adjustments to services to improve patient care.

Digital mammography, operating across screening and diagnostic centres within a supportive infrastructure, has numerous advances over analog technology. It offers better resolution for dense breasts, potential reduction in repeats and recalls, lower biopsy rates, reduced use of film chemicals, better utilization of professional staff, and increased productivity.¹⁷ HA managers report that digital technology increases productivity by approximately 20%. Further data will need to be collected to verify this.

This would be an ideal time to develop an overall strategy and business case, in collaboration with the MoHS, HAs and CICs, to implement digital mammography across screening and diagnostic centres in the province. A provincial approach would offer significant advantages in terms of pricing, maintenance and support, and easier integration.

It is important to recognize that there will be challenges associated with digital implementation in BC. As such, we will need to develop strategies to mitigate the risks and address potential barriers such as privacy and security of information, staff training and continuity of services. In addition, the interface with CICs will need to be addressed including the structuring of financial arrangements, timing of equipment conversion, integration of information systems and sharing of confidential information.

2.2.8 Workforce Issues

Many of the people interviewed for this plan, identified staff shortages as a major impediment to improving the breast cancer screening and diagnostic system in BC in the long term. A recent report conducted by SMPBC highlights the impending shortage of both breast imaging technologists and radiologists and recommends strategies to address them.¹⁸ In addition, the

Canadian Breast Cancer Foundation (BC/Yukon Chapter) 2020 Healthcare Workforce Working Group and Dr. Paula Gordon of BC Women's Hospital & Health Centre produced reports identifying workforce issues in breast imaging and recommending improvements.^{19 20} These reports draw similar conclusions and recommend strategies that can be summarized as follows:

- Train more Medical Radiation Technologists and Ultrasonographers to work in mammography by increasing the number of training spots in academic institutions and by increasing training opportunities outside the Lower Mainland.
- Cross train mammography technologists to perform ultrasound and vice versa, so that dually-trained technologists can perform both procedures on a patient in one appointment.
- Review the FFS reimbursement mechanisms for Radiologists who work in breast health to ensure that the compensation levels for breast screening and diagnostic procedures are aligned with other medical imaging procedures. Particular attention should be paid to simultaneous procedures performed in the same day and to compensation for longer more complicated procedures such as image guided core biopsies.
- Provide opportunities for specialized breast health training for Radiologists by establishing fellowships at selected hospitals. In 2009 BCW, BCCA and X-Ray 505 collaborated on a fellowship position which PHSA funded for 3 years. They are proposing another one be established with BCW Foundation funding. Other hospitals may be interested in providing fellowship training as well.
- Improve the technology in breast screening and diagnostic centres to recruit and retain staff. Breast imaging is the last field that still relies mostly on film x-ray and, as such, it is not seen as a leading-edge practice. There are also more overuse injuries with analog machines and concerns about exposure to toxins in film processing.
- Incorporate other professionals into the diagnostic process. Family physicians and/or nurse practitioners may be able to be trained to perform image guided biopsies under the general direction of a Radiologist. Alberta employs this model. Physicians and/or nurse practitioners may also be able to conduct clinical breast exams (where indicated).
- Train and implement Navigators in the breast health system to assist patients and/or providers to navigate and improve the diagnostic pathway.
- Provide opportunities for both radiologists and medical imaging technologists to work with multiple modalities.

3 The Future

The breast health system of the future will offer high quality screening and a seamless continuum of care for women from screening through to treatment. Evidence-based services will be delivered by breast health specialists using modern equipment and technology. A woman with an abnormality suspicious for breast cancer will be diagnosed quickly – ideally in one day. She

will feel supported and have the information she needs to make good decisions. She will know when her next appointment will be and what to expect along the way.

The clinical pathway will be clear and consistently applied and understood by both women and their providers. Information technology will allow images to be quickly transferred between centres and read remotely. All providers involved in screening, diagnosis, treatment, and follow-up will work as an interdisciplinary team with the patient in the centre. Providers in rural and remote communities will be able to consult with experts in urban centres using tele-health technology.

3.1.1 Experiences in other Jurisdictions

European countries have improved their breast health system by defining the desired pathway, implementing breast health specialists and establishing Specialist Breast Units (SBUs). This is supported by the European Society for Breast Cancer Specialists (EUSOMA), a group that defines standards and guidelines that cover all aspects of breast health from risk and prevention to diagnosis, treatment, and follow-up.

According to the EUSOMA guidelines, SBUs are required to function as a single program, although services can be spread over two or more locations. They must be staffed by breast specialists, see a sufficient number of cases, work in interdisciplinary teams, have patient support, and provide a full range of services from genetics and prevention, through treatment, to care of advanced disease and palliation. They must collect data, report on, and review performance. Although a breast unit does not have to be in one location, the providers involved must be in close enough proximity to work as an interdisciplinary team and follow the same protocols.²¹

Cancer Care Ontario has recently strengthened their diagnostic system by upgrading provincial standards that define the organizational and practice-setting features expected of diagnostic assessment programs (DAP). They offer two options for integrated care – One-Stop Diagnostic Assessment Units and Virtual Diagnostic Assessment Units. Women who do not have access to such integrated facilities are captured through a Central Access System (CAS). These centres bring eligible patients into the DAP and communicate patient appointment schedules, procedure description, preparatory activities, and patient information to the patient and interdisciplinary team.²²

Alberta has taken a different approach by placing the family physician in the centre of cancer care through the Comprehensive Breast Care Program (CBCP). This program, currently in the demonstration phase, ensures that the family physician remains the primary care provider for breast cancer patients and that he/she plays an active role throughout the entire continuum of breast cancer care. Family physicians are directly supported by a nurse navigator and a breast expert (physician with special training) who are backed by an interdisciplinary team including radiologists, pathologists, surgeons, radiation and medical oncologists, psychologists, and social workers. The team guides the physician in appointment bookings, referrals, treatment information and radiology expertise, provides updates regarding the patient's progress, status and next steps, and gives reminders for on-going monitoring and follow-up visits.²³

We plan to build on the innovative practices that have been already been implemented locally and apply the lessons learned from other jurisdictions to develop a comprehensive breast health system that will function effectively in BC. As part of this process, we will consider how a patient-centred funding model (i.e. pay for performance) can be used alongside the development of provincial standards.

3.1.2 A Provincial Approach

The BCCA has developed clinical guidelines that cover all parts of the breast care continuum. We plan to expand on this work by convening a Provincial Breast Health Steering Committee with representation from HAs, MoHS, CICs and community partners to implement the actions contained in this report. Through this process we will work across the system to:

- Develop a provincial framework, vision, and principles to guide the delivery of breast health services in BC
- Improve and standardize the level of breast health services by identifying the most suitable screening and diagnostic procedures and promoting their use
- Make high quality services available to all women and measure those services to ensure that they meet quality standards
- Ensure that professionals working in the system are highly trained and maintain their expertise by performing a sufficient volume of work
- Implement training and post-graduate programs in breast health, and
- Promote research as well as knowledge synthesis, translation, and exchange in breast health

3.1.3 Primary Prevention

The causes of breast cancer are complex and most of the evidence linking modifiable behaviours with breast cancer is weak. However, new evidence is constantly emerging and a recently published report concluded that there is a causal link between smoking and breast cancer incidence.²⁴ We plan to keep abreast of the developments in this area and implement primary prevention strategies to address the risk factors for breast cancer through an integrated approach to population and public health in collaboration with our partners. The ultimate goal is to decrease the incidence of breast cancer and reduce demand on the system.

4 Strategies to Improve the System

In this section we propose a number of strategies to achieve improvements in the breast health system in BC.

Objectives & Milestones <i>(detailed actions & milestones are outlined in the Project Charter)</i>	2010/11				2011/12			
	June	Sept	Dec	Mar	June	Sept	Dec	Mar
Objective #1: <i>To improve quality and consistency in the clinical pathway from breast cancer screening to initiation of treatment.</i>								
1.1. Develop a provincial framework, clinical pathway and standards to guide breast health in BC and ensure that there is ongoing measurement and coordination of services.				◇				
1.2. Redesign, standardize and streamline the clinical pathways to ensure that women receive high quality services in a timely manner regardless of where they live.					◇			
1.3. Increase the integration of screening and full service diagnostic programs.						◇		
Objective #2: <i>To increase capacity in the breast health system.</i>								
2.1 Develop a strategy to implement digital mammography equipment and related information technology in the screening mammography program.				◇				
2.2 Integrate the screening mammography replacement strategy with the diagnostic equipment replacement strategy in Health Authorities and Community (private) Clinics.					◇			
2.3 Increase the number of highly qualified professionals in breast cancer screening and diagnostic services through recruitment and retention strategies.						◇		
Objective #3: <i>To improve the effectiveness of the Screening Mammography Program of BC (SMPBC) in reducing mortality due to breast cancer.</i>								
3.1 Update the screening policy to ensure that the program targets women who would receive the most benefit from screening mammography.			◇					

Objectives & Milestones <i>(detailed actions & milestones are outlined in the Project Charter)</i>	2010/11				2011/12			
	June	Sept	Dec	Mar	June	Sept	Dec	Mar
3.2 Develop strategies to recruit and retain at least 70% of eligible women (the FMM target) while working towards the broadest participation of women in the screening mammography program.								◇
Objective #4: <i>To decrease the incidence of breast cancer and demand on the breast health system.</i>								
4.1 Determine the most effective (evidence-based) approach to primary prevention of breast cancer.				◇				
4.2 Collaborate on the delivery of primary prevention programs to avoid overlap, duplication and confusing messages.					◇			
4.3 Integrate the delivery of primary prevention of breast cancer with healthy living (prevention) programs at PHSA, HAs & community agencies.					◇			

References

- ¹ Canadian Cancer Society, Statistics Canada, Provincial/Territorial Cancer Registries, Public Health Agency of Canada, *Canadian Cancer Statistics*, 2009, www.cancer.ca/statistics
- ² Public Health Agency of Canada, Organized Breast Cancer Screening Programs in Canada, Report on Program Performance 2003 & 2004. www.phac-aspc.bc.ca
- ³ International Agency for Research on Cancer, 2008 <http://www.iarc.fr/>
- ⁴ Coldman, A., Phillips, N. Warren, L. and Kan, L., Breast cancer mortality after screening mammography in British Columbia women, *Int. J. Cancer*: 120, 1076-1080 2006 Wiley-Liss, Inc
- ⁵ The Screening Mammography Program of BC web-site, <http://www.bccancer.bc.ca/PPI/Screening/Breast/default.htm>
- ⁶ Screening for Breast Cancer: U.S. Preventative Services Task Force Recommendation Statement, *Annals of Internal Medicine*, Vol. 151. No. 10, 2009
- ⁷ BC Cancer Agency Guideline, MRI (Magnetic Resonance Imaging) Updated July 16, 2009 <http://www.bccancer.bc.ca>
- ⁸ Shields, M., Wilkins, K., An update on mammography use in Canada, *Statistics Canada Health Reports*, Vol. 20, no. 3, September 2009
- ⁹ Screening Mammography Program of British Columbia, 2008/09 Annual Report, pg. 8
- ¹⁰ Quality Determinants of Organized Screening Programs in Canada; Prepared by the Canadian Breast Cancer Screening Initiative 2003
- ¹¹ Screening Mammography Program of British Columbia, 2008 Annual Report
- ¹² European Society of Breast Cancer Specialists (EUSOMA) Guidelines, *Improving Breast Cancer in Europe* (2007), www.eusoma.org
- ¹³ Pedersen, Allison and Hack, T., Pilots of Oncology Health Care: A Concept Analysis of the Patient Navigator Role, *Oncology Nursing Forum*, Vol. 37, No. 1, 2010
- ¹⁴ Bruening, W., et al, Systematic Review: Comparative Effectiveness of Core-Needle and Open Surgical Biopsy to Diagnose Breast Lesions, *Annals of Internal Medicine* 2009

-
- ¹⁵ A Breast Cancer Diagnostic Human Resource Proposal to the Ministry of Health, Addendum – Stereotactic Biopsy developed by Gordon, P.B., Wilson, C., Warren, L., J. 2009
- ¹⁶ Poole, B., Gelmon, K., Borugian, M., Kan, L. and Stilwell, M., Breast Cancer Screening and Diagnosis in British Columbia, *BCMJ*, Vol 50, No. 4, May 2008
- ¹⁷ Roger, R., and Boyd, B., Introducing Digital Mammography into BC’s Screening Mammography Program 2006
- ¹⁸ Screening Mammography Technologist Workforce in BC, The Screening Mammography Program of BC, Feb 2010
- ¹⁹ A Breast Cancer Diagnostic Human Resource Proposal to the Ministry of Health, Gordon, P.B., Wilson, C., Warren, L., J. 2009
- ²⁰ 2020 The Future Without Breast Cancer: Report on the Healthcare Workforce Working Group, Canadian Breast Cancer Foundation - BC/Yukon Chapter 2009 – DRAFT Not for Circulation
- ²¹ European Society of Breast Cancer Specialists (EUSOMA) Certification Process for Quality in Comprehensive and Multidisciplinary Breast Care 2007 www.eusoma.org
- ²² Brouwers, M., Crawford, J., Elison, P., Evans, W.K. Gagliardi, A., Holmes, D., et al., Cancer Care Ontario, Organizational Standards for Diagnostic Assessment Programs: Recommendations, Ontario 2007
- ²³ Alberta Health Services Comprehensive Breast Care Program 2009
<http://www.cancerboard.ab.ca/Professionals/CBCP>
- ²⁴ Collishaw NE, Boyd NF, Cantor KP, et al., Canadian Expert Panel of Tobacco Smoke and Breast Cancer Risk, Toronto, Ontario Tobacco Research Unit (OTRU) Special Report Series 2009