



Breast Cancer In *Young Women*

Breast Cancer in Young Women: Project Summaries

Program Principal Investigator: Dr. Steven Narod, Women's College Hospital, Toronto
Program Title: Towards better outcomes for young women with breast cancer: A Pan-Canadian Collaborative

Summary:

Approximately 5.4% of breast cancer cases in Canada occur before the age of 40. The relatively poor prognosis of young women with very early onset breast cancer suggests that women diagnosed before the age of 40 may best be treated differently than older women, in terms supportive care and self-management, the influence of a suite of known breast cancer causing genes, the impact of unhealthy lifestyle on increased risk of breast cancer, making decisions about fertility preservation, the impact of breast-conserving surgery, treatment delay ramifications, and provision of optimal care through multi-disciplinary cancer conferences. We propose to study 1,200 young breast cancer patients to identify the optimum treatments and improve their chances of survival. To address these questions identified as critically important for young women with breast cancer, we will establish a national network of breast cancer researchers and a Canadian study of 1,200 women with breast cancer diagnosed before age 40. These women will be enrolled over a four-year time period, during which our team will collect treatment information and details about lifestyle and fertility. The data and specimens will be made available to researchers across Canada to address many questions. A national web-based system will assist women overcome stress associated with a diagnosis of breast cancer. We will advise provinces regarding genetic testing policies for breast cancer across Canada and we will provide a model framework for young women with breast cancer who wish to preserve fertility. The new knowledge we create will be used to help guide policy regarding the optimal treatment of breast cancer in young women to improve prognosis and quality of life for these young women.



SubProject Principal Investigator: Dr. Christine Friedenreich, Alberta Health Services, Calgary
SubProject Title: The impact of modifiable lifestyle factors in breast cancer survival in young women

Summary:

Breast cancer in young women (BCYW) is often associated with high rates of morbidity and mortality yet there is limited understanding on how to improve their survival. Hence, we are seeking to examine the question, “does an unhealthy lifestyle characterized by low levels of physical activity, sedentary behaviour, high caloric intake, low phytoestrogen and micronutrient intake lead to increased levels of inflammation and increase risk of recurrence, new primaries and mortality in BCYW?” This project is part of a Pan-Canadian research study that will enroll 1,200 women diagnosed under the age of 40. We will use biological measurements and questionnaire data to quantify how: 1) having an imbalance in daily energy levels (measured using body size, abdominal obesity, physical activity, sedentary behaviour); 2) consuming dietary components including folate, isoflavone and lignans; 3) vitamin D levels, anti-inflammatory medication use and level of inflammation affect breast cancer survival among young patients. Lifestyle factors will be measured before treatment/surgery and again at 1 year and 3 years to see if levels change after a breast cancer diagnosis. Biological factors will be measured from blood collected before surgery to examine whether or not they are related to survival after breast cancer diagnosis. Advanced statistical modeling will be used to determine the inter-relationships between the lifestyle factors of interest in this project and how they combine to affect breast cancer survival. In completing these investigations, this project will provide valuable new data and directions for clinical interventions that could be aimed at changing these behaviours in young women as a means of improving their outcomes after diagnosis.

SubProject Principal Investigator: Dr. Nancy Baxter, St. Michael’s Hospital, Toronto
Marko Simunovic, McMaster University, Hamilton
Scott Tyldesley, British Columbia Cancer Agency, Vancouver
May Lynn Quan, Alberta Health Services, Calgary
SubProject Title: Knowledge to Action: Improving local therapy for young women with breast cancer across Canada

Summary:

Young women with breast cancer (YWBC) have a higher incidence of cancer recurrence than older women with this disease. To improve outcomes for these patients, we must gain a better understanding of the factors that contribute to a worse prognosis and are amenable to change (i.e. delays in treatment, type of surgery). This subproject will evaluate three aspects of peri-operative care for YWBC. We will first evaluate how often YWBC experience delays in treatment and if the delay has an impact on their cancer. To do this we will use data from the Canadian Young Breast Cancer Cohort. We will look at the time from when a woman first notices a problem to surgery, and will determine how many women have > 12 week delay. We will assess the factors



leading to delay and the impact of delay on cancer stage. The second study will evaluate the safety of breast conserving therapy (BCT) for YWBC. BCT is safe in older women, but may be more risky in YWBC. We will examine the records of 3,000 YWBC from five provinces. We will determine what surgery they had (BCT or mastectomy) and if the type of surgery impacted on cancer survival. This study, the largest conducted, will definitively answer this question. The final study will implement pre-operative discussions between specialists (surgery, oncology, radiology) to develop the most appropriate treatment plans for YWBC. This study will lead to improved care, and will set a national standard for surgical quality initiatives in breast cancer. In the long term, this study aims to improve outcomes and reduce cancer recurrence in YWBC across Canada. Through the publication of at least five peer-reviewed journal articles and conference presentations, we will disseminate our study findings to the scientific community and general public.

SubProject Principal Investigator: Kelly Metcalfe, University of Toronto, Toronto
SubProject Title: Expanded Genetic Testing in Women with Young Onset Breast Cancer

Summary:

Approximately [5.4%] of breast cancers in Canada occur in women before the age of 40 years. Known risk factors for young-onset breast cancer are few and can only account for a very small proportion of cases. However, with the identification of new breast cancer predisposing genes, further exploration of the contribution of these genes to young-onset breast cancer is required. With the identification of genetic mutations, a patient could be counseled on her subsequent risks of other types of cancers (including contralateral breast cancer) and elect for cancer risk reduction options. Furthermore, relatives unaffected with cancer could then be tested to determine their cancers risks and be presented with options to reduce their risk of cancer. Our proposed pan-Canadian collaboration, in which 1,200 women with young-onset breast cancer will be recruited, is in the *unique position to evaluate the contribution of 25 known breast cancer causing genes in this population of young women*. We then will be able to assess current genetic testing guidelines to determine if other genes in addition to BRCA1 and BRCA2 should be considered for use in clinical genetic testing for women with young-onset breast cancer. *The results of this study and ensuing changes in delivery of cancer genetics services could ultimately have a profound influence on cancer-related mortality in women with young-onset breast cancer and their relatives.*



SubProject Principal Investigator: Ellen Warner, Sunnybrook Hospital, Toronto
SubProject Title: SPOKE & GYPSY: Studies to Encourage Early Fertility Preservation Referral and to Predict Effects of Treatment on Fertility of Young Women with Breast Cancer

Summary:

Young women newly diagnosed with breast cancer, who have not yet completed their families, worry greatly about whether they will be able to have children after getting ovary-damaging chemotherapy and/or taking 5 years of tamoxifen (when pregnancy must be avoided). Many of these women opt before treatment to have fertilized or unfertilized eggs frozen, which can be used for a future pregnancy (fertility preservation/FP). However, women are often not told about the option of FP in time to avoid treatment delay, if ever. We also do not yet know how to predict which women will still be fertile after treatment and could be spared the stress and expense of FP. We propose two studies. In the 1st, we will create an educational Webinar and patient information resources for breast cancer surgeons to encourage them to offer FP to all their young patients soon after a breast cancer diagnosis. Then patients and surgeons will be surveyed to determine whether we have achieved our goal. In a 2nd, study we will measure the fertility of 1,140 young breast cancer patients before treatment and then yearly using a blood test called AMH and an ovarian ultrasound. The aim will be to have the capability to predict, based on fertility measures before treatment, age and other factors, how treatment will affect the future fertility of a particular woman. Both these studies will help ensure that the growing number of women surviving breast cancer can still have the children they wished for before their diagnosis.