



**Improving the Productivity and Competitiveness of Canada through an  
Investment in Ovarian Cancer Research**

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## Issue

The current survival rate for all cancers is the highest it has ever been, with 60% of patients surviving for at least five years after treatment. Survival rates are 95% for prostate and 87% for breast cancer, reflecting significant investments in research that have led to better screening methods, early diagnosis and a more effective range of treatment options. In contrast, ovarian cancer has no screening test, 70% of patients are diagnosed at advanced stages of the disease, and one in two women will not survive five years. Patients have been treated with the same, often unsuccessful, methods of surgery and chemotherapy since the 1990's. Despite this, federal investment in ovarian cancer research lags well behind other, lower-mortality cancers. According to the Canadian Cancer Research Alliance, between 2010-2014, the Canadian Institutes of Health Research (CIHR) invested \$16.9M in ovarian cancer research while investing \$81.3M in breast cancer and \$39.8M in prostate cancer research. The 5-year mortality rate for ovarian cancer is 56%, while for breast cancer it is 13% and for prostate cancer it is 5%. We believe that the tremendous advances seen in the prognosis and treatment of breast and prostate cancers can largely be attributed to significant research investments. Unfortunately, ovarian cancer has not seen such levels of investment, and outcomes have remained the same for fifty years.

The diagnosis of ovarian cancer is highest in women aged 55-64, when they are at the most productive time of their working lives. When women at the prime of their lives die, the detrimental consequences are felt at many levels – their families, jobs, volunteer work, and in the Canadian economy. Losing these women means their voices are lost and they are unable to be strong, vocal advocates for change. To ensure that Canadian women remain healthy and as productive as they can be, Ovarian Cancer Canada is calling for focused attention and an increased investment of at least \$10 million by the federal government in ovarian cancer research. With this research investment, women diagnosed with ovarian cancer can live longer, better lives, and remain contributing members of Canadian society.

## Ovarian Cancer Canada – Creating the framework

In 1997, the Corinne Boyer Fund was established to advance ovarian cancer research and raise awareness of the disease in Canada. The Fund led to the creation of Ovarian Cancer Canada, which is the only national charitable organization dedicated to this disease. Working with leading health care providers, researchers, and women diagnosed with ovarian cancer, Ovarian Cancer Canada developed a strategy to advance ovarian cancer research in Canada from the handful of researchers with limited funding who were working on the disease in Canada. The strategy focused on increasing the number of researchers; building the capacity for ovarian cancer research and increasing available funds. Since its inception, Ovarian Cancer Canada has invested more than \$6M in ovarian cancer research and built strategic partnerships with organizations such as CIHR, the Cancer Research Society, BioCanRx and the Terry Fox Research Institute to advance ovarian cancer research. The organization created Canada's only ovarian cancer research conference, partnered with CIHR and the Cancer Research Society to increase the number of grants funded annually, established a national ovarian cancer tissue bank, funded capacity grants to train new scientists, and supported a large scale biomarker project. As a result of our efforts, there are over 200 ovarian cancer researchers in Canada, coordinated and connected through an informal Ovarian Cancer Research Consortium, led by our Chair in Ovarian Cancer Research.

In the past decade, the Canadian Ovarian Cancer Research Consortium has contributed to many major advances, including the identification of strategies to reduce risk of ovarian cancer, the accurate

subtyping of ovarian cancers, the identification of the mutations associated with those subtypes, the discovery of biomarkers that better predict prognosis and response to chemotherapy, and the

determination of the importance of the immune system in controlling response to treatment. Through the efforts of Ovarian Cancer Canada, this research network is now primed and capable of supporting large-scale projects, ensuring that there are enough patients and/or samples to result in effective findings. The investment needed is beyond our capacity to fund. We cannot rely on our community for funding as other cancers can, because most of the women die within 5 years of diagnosis.

### **What is needed to advance ovarian cancer?**

Two recent international assessments of the current challenges in ovarian cancer prioritized: 1) developing new research models; 2) developing novel treatments; 3) advancing clinical trials. In combination, these priorities highlight the research phases needed to advance a personalized medicine platform for ovarian cancer. This patient-oriented approach to care has been advocated by several leading national and provincial agencies.

#### ***1) Develop better experimental models***

***\$2.25 million***

Testing of new treatment strategies requires a collection of experimental model systems to ensure the safety and efficacy of the treatment. Simply put, the better the experimental model, the more clinically applicable the outcome. The past decade has seen intense activity around developing and validating preclinical models for ovarian cancer, which demonstrated the many strengths and some limitations of the models currently available. Canadian scientists have been key players in ovarian cancer model development. Even within one subtype, ovarian cancer can be very heterogeneous and seems to evolve quickly – a process that we do not yet understand. Better model systems will enable us to study this heterogeneity and how it evolves. Researchers are well-positioned to create and improve these models to learn more about how ovarian cancer starts, about how it progresses and, most importantly, how it can be stopped. These models are needed to bridge the gap between discovery and validation of new treatments, and the testing of those treatments in women with ovarian cancer.

#### ***2) Identify and prioritize development of novel treatment strategies***

***\$2.25 million***

Most ovarian cancer patients initially respond well to treatment. However, relapse occurs in the majority of women diagnosed and there are few effective treatment options for these women. Research teams across Canada have been at the forefront of designing new treatment strategies. These include developing drugs that target factors critical to cancer cell survival, generating oncolytic viruses that selectively kill cancer cells, and developing strategies to manipulate the tumour microenvironment that supports cancer growth. A number of these treatment approaches are poised for clinical testing (phase 1 clinical trials), with more being at the important stages of validation and preclinical testing. With an investment of approximately \$2.25 million, we can advance the study of the most promising strategies to achieve more effective treatments which will result in lives enhanced, extended and potentially, saved.

#### ***3) Stratify patients in clinical trials***

***\$5.5 million***

In women with ovarian cancer, the response to chemotherapy is variable. This is because there are several subtypes of ovarian cancer that differ in many aspects, including histology, molecular pathology, response to treatment, and length of patient survival. Identifying women who are not likely to respond to standard treatment, and offering these individuals alternative treatments, remains one of the most important goals in the clinical management of ovarian cancer patients. There are several experimental treatments currently in development (e.g. PARP inhibitors, immune therapies, oncolytic viruses, vaccines), some of which have had little to no opportunity to be tested in women with ovarian

cancer. These trials have the potential to introduce personalized medicine within five years into the sphere of ovarian cancer, by supporting a network of sites able to do clinical research, bank longitudinally through the established tissue bank, and support assay development. The scope and intensity of this plan requires recruitment of dedicated personnel to coordinate activities, infrastructure support, an outcomes registry, and a specific focus on evaluative research and knowledge translation. Developing clinical trials with regard to the specific subtype, which until recently has not been done, is essential if the appropriate and effective treatment for each subtype is to be identified.

### **Current Challenges in the Canadian Research System**

The Canadian Ovarian Cancer Research Consortium is poised to act immediately to improve the survival and well-being of women with ovarian cancer. However, there are a number of challenges in the current research environment which limit the ability to focus on the priorities.

- 1) Rationalizing the need: The incidence of ovarian cancer is low compared with many other types of cancer, so economic benefit for longer-term survival for women with ovarian cancer has been considered minimal by research funding panels.
- 2) Ovarian cancer is too common to be considered rare, and not quite fatal enough to be considered a high fatality cancer, so it is excluded from many funding opportunities.
- 3) To be able to accrue sufficient patients to a subtype-specific clinical trial, each trial must involve multiple locations. Large scale team grants are not a focus for funders and the investment required is greater than can be realized by Ovarian Cancer Canada.
- 4) The identification of better treatments requires relevant model systems for each subtype, which currently do not exist and funding for models is non-existent.
- 5) There is insufficient funding for drug discovery for targets that have already been proven to be effective in preclinical trials.

### **Budget Request**

An immediate investment of \$10M from the federal government in ovarian cancer research is needed to advance a personalized medicine platform for ovarian cancer. Ovarian Cancer Canada will work in partnership with leading Canadian research organizations such as the Terry Fox Research Institute, Cancer Research Society, 3CTN, CIHR, Bio CanRX and the Canadian Cancer Society to advance this framework. Ovarian Cancer Canada will also work within existing research frameworks such as the Canadian Cancer Research Alliance's strategy to maximize focus. Potential partners have recognized the limitations of current funding streams and are open to exploring potential partnerships with Ovarian Cancer Canada.

Ovarian Cancer Canada also supports the submission of the Health Charities Coalition of Canada (HCCC). As a member of HCCC, we support their recommendations for greater access to medicines and for investment in research that will provide jobs and stimulate the economy, setting the stage for improved prosperity and innovation in the future. Additionally, we support the recommendation for the Government of Canada to establish a formal mechanism for meaningfully and continuously engaging patient representatives in decision making and regulatory processes on issues related to health and health research.