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Dr. Elizabeth Eisenhauer, head of the Queen's Department of Oncology, Dr. Joe Pater, former CCTG Director, Dr. Janet Dancey, CCTG Director,

Patients facing a cancer diagnosis invariably have many questions, but one tops the list – what is the best treatment? Answering that question is the compelling goal of medical research that is testing new treatments for similarly-diagnosed patients in carefully monitored and controlled ways. Such studies, known as clinical trials, have been instrumental in altering and improving the way cancer is now approached.

For Dr. Elizabeth Eisenhauer, head of the Queen's Department of Oncology, the link between clinical trials and the progress of cancer therapy is all too clear. She explains the differences between how a middle-aged woman with breast cancer was treated in 1965, and how the same condition is managed today. In 1965, a combination of extensive and disfiguring surgery and radiation sometimes did little to prevent the fatal spread of the disease. Fifty years later, innovations such as implementation of breast cancer screening, genetic insights, less aggressive surgical procedures, chemotherapy, and targeted hormones and other drugs have together dramatically increased survival rates and quality of life.

"Over the last 50 years, we have seen about 5 to 10 new approaches to breast cancer treatment now implemented in practice," Eisenhauer points out. "All of them are the result of clinical trials and almost all are related to academic cooperative group clinical trial findings."

The emergence of academic cooperative groups – which unite the efforts of investigators at many different universities, hospitals, and cancer care centres – has become key to the success of clinical trials. Any particular member of these networks might have direct access to just a

handful of patients who would be suitable for testing some new drug or other therapy; however, collaboration across the group ensures the possibility of a trial with a sufficiently large number of participants to make for a scientifically significant research undertaking.

Here in Canada, the bulk of this group work is facilitated by a single body, the Canadian Cancer Trials Group, with its central operations located on the Queen's campus next to Kingston General Hospital. Tucked in behind Botterell Hall in the Queen's Cancer Research Institute building, the Group is home to more than 100 staff members who coordinate the activities of approximately 2,000 investigators, a group that includes oncologists, hematologists, radiologists, surgeons, and nurses at some 80 separate member institutions in all corners of the country. At any given time, the Canadian Cancer Trials Group may be overseeing as many as 30 to 40 trials amongst these far-flung sites, as well as others even further afield in collaboration with similar groups in other countries.

"I don't think you could identify any cancer specialist in the country who has not participated in our clinical trials," suggests Dr. Janet Dancey, who became the Group's most recent director in 2014. She describes the organization as the hub of a wheel in which the participating investigators and their member institutions act as spokes. Together, they mount the expertise and resources necessary to tackle the question that remains uppermost in a cancer patient's mind.

"We always want to demonstrate patient benefit, that we have a better treatment, but we also want to know about the side effects of treatment, the costs of treatment, the impact on quality of life," explains Dancey. "These types of additional studies are also incorporated into our trials."

The Canadian Cancer Trials Group's present size and scope have been the result of a steady evolution that goes back to the 1970s, when Canadian investigators began conducting trials in Canada emulating the success of American cancer cooperative groups. Dr. Joe Pater, then a hematologist at KGH, became the first director of the Group.

"It seemed to me that Canada had some natural advantages in carrying out applied clinical research – the organization of the health care system as well as some notable figures who had done clinical research here," he recalls. "We had strengths in clinical research, we had people interested in it, and so it was an appealing opportunity."

The then-named National Cancer Institute of Canada wanted to base this work in Toronto, but Pater had grown fond of Kingston and convinced them to let him setup shop here. Among his earliest initiatives was gaining permission to test some of the latest, most innovative drugs that were being studied in the US. The American government had tightened up the regulations surrounding this work and would only release such products to designated cooperative groups.

Pater hired Eisenhauer in 1982 to become one of the principal liaisons to the US NCI, which gave her a front-row seat to assess some of the world's most advanced cancer therapies. She observed that the development of these products generally took place in academic circles, since at that time the drug industry had dismissed most cancer treatments as expensive and largely ineffective. That attitude had changed by the 1990s, as clinical trials began to highlight game-changing agents like Herceptin, which has had a major impact on breast cancer outcomes in patients whose tumours harbour the HER2 protein.

The Group obtained funding from NCIC through a peer-review process to establish an Investigational New Drug Program, which has since conducted more than 200 early trials of innovative therapies, including some that have gone on to become the standard of care.

In addition to joining major American trials and sitting on scientific panels overseeing these projects, members of the Canadian Cancer Trials Group have also built similar bridges to 40 other countries. "We are the conduit to international scientific trial organizations," Dancey notes.

Pharmaceutical companies subsequently began to partner with the Group, but she is careful to distinguish these partnerships from a purely contractual arrangement to carry out clinical trials of a product that is being prepared for market. Instead, such companies are eager to take advantage of the Group's highly efficient operation, which makes initial testing of drug candidates much more cost effective. And in contrast to many contracted clinical trials, the Canadian Cancer Trials Group retains ownership of the data generated by this research, which can then be published in scientific journals.

"It's recognition that you can derive benefit by being collaborative and partnering," Dancey says. "And clinical trials are, by necessity, the most collaborative of research activities."

Even so, such industrial collaboration only accounts for about a third of the Group's revenue. The rest comes from government agencies and dedicated charities, with the largest single amount coming from a core program grant from the Canadian Cancer Society (which integrated with the National Cancer Institute of Canada in 2009). Specific trials may be supported by other granting agencies such as the Canadian Institutes of Health Research, Prostate Cancer Canada, or the Canadian Breast Cancer Foundation, while infrastructure funding has also recently been obtained from the Canada Foundation for Innovation.

Pater recalls that for a long time the NCIC was not sure how to deal with the Group, whose complex role did not fit into the typical model for cancer research. It was not until the late 1990s that the Group's ongoing existence was assured by an internal task force that confirmed the value of that role.

Currently, many participating institutions are finding it more difficult to contribute to that role, as tighter regulations and funding shortfalls have left many parts of Canada's health care system with fewer resources for clinical trials. That prospect worries Eisenhauer, who sees the need to continue serving patients as much as possible.

"The questions that are most likely to affect patients are the same questions that people who treat patients wonder about," she says. "Do we need to take off a whole breast or just the lump? Do we really need to irradiate the whole brain, or just the spot where the tumour is? Those are questions pharmaceutical firms will never answer. Yet they are important questions that come from the academic sector, from the people who see and treat patients."

At the same time, Eisenhauer remains confident that the Canadian Cancer Trials Group has set new standards in patient care. Patients practically anywhere in the country will find a group member wherever they are being treated, but even if they do not take part in a specific trial, Eisenhauer maintains that they will still benefit from the expertise that is cultivated at places where clinical trials occur.

"The Canadian Cancer Trials Group has created a national culture of interest in improving cancer outcomes and making trials part of the way we do business," she says.

Dancey puts the matter even more passionately: "There are still too many people who die of cancer," she concludes. "But from 1930 to today, probably twice as many people live following a cancer diagnosis, and that will continue to improve. Being part of that is a wonderful thing."

Adapted from an article written by Tim Lougheed with permission of the [Office of the Vice-Principal \(Research\) at Queen's University](#). The story was first featured in their [\(e\)AFFECT research magazine](#)."