

Canadian Cardiovascular Outcomes Research Team: Lessons Learned

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About the Author

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Background

The Canadian Cardiovascular Outcomes Research Team (CCORT) was created in 2001 through a \$4.6 million 5-year Canadian Institutes of Health Research (CIHR) Interdisciplinary Health Research Teams grant and a \$1 million grant from the Heart and Stroke Foundation of Canada. Funding was renewed in 2006 for an additional 5 years (2006–2011) through a \$4.2 million CIHR Team Grant in Cardiovascular Outcomes Research. CCORT involves over 30 investigators from six Canadian provinces (Nova Scotia, New Brunswick, Quebec, Ontario, Alberta, and British Columbia) working together, over the past decade, on research aimed at measuring and improving the quality of cardiac care. CCORT has generated over 155 peer-reviewed publications and provided funding to over 50 students (summer students to postdoctoral fellows) from across Canada to pursue training in cardiovascular (CV) outcomes research. CCORT's national coordinating centre has been located at the Institute for Clinical Evaluative Sciences (ICES), in Toronto, Ontario since its inception.

Rationale for Team-Based Research

Historically, medical research involved small studies conducted by solitary scientists or small teams working in isolation in a local laboratory. Today's complex research questions, in contrast, often involve large-scale, multi-site studies and require multidisciplinary research teams with diverse professional and technical skill sets. These teams, enabled by technology, collaborate across time and space, as they address local as well as global health issues.

The creation of CIHR was motivated, in part, by a vision of health research where scientists working in four pillars of research (biomedical; clinical; health systems services; social, cultural, environmental, and population health) collaborate to bring research from "bench-to-bedside-to-community," in order to improve the health of Canadians as well as the quality and sustainability of the Canadian health care system. An additional mandate of CIHR's multidisciplinary teams, including CCORT, involves active engagement in knowledge translation (KT) activities to translate research findings into improvements in health for Canadians.

While collaborative research is a highly desirable outcome for funding bodies, and team-based approaches can provide the capacity required for complex areas of study,¹ the practical reality of doing team-based research and KT can involve many challenges. Over the past decade, CCORT has undertaken a number of large and complex research studies. These studies, including the development of a national CV atlas and the completion of two cluster randomized trials on the effectiveness of health care report cards, provided valuable experience; hopefully, sharing our experience will assist others embarking on team-based research initiatives.

CCORT Canadian Cardiovascular Atlas

The objective of the CCORT Canadian Cardiovascular Atlas project was to

create a comprehensive "report card" on the patterns of CV health and care delivery in Canada. Building on prior work completed in Ontario, the CCORT Atlas project, launched in 2002, addressed topics ranging from geographical variations in the burden of cardiac risk factors and disease to variations in survival rates following acute myocardial infarction (AMI) and cardiac surgery. Published as a series of 24 peer-reviewed articles in the *Canadian Journal of Cardiology* from 2003 to 2005, the atlas was compiled as a book in 2006, and freely distributed, in print form and electronically, via CCORT's website where it has been downloaded over 50,000 times.^{2,3}

The CCORT Atlas proved to be an ideal team-based project as it required a large group of clinician researchers with expertise spanning the spectrum of CV medicine, from primary care to acute hospital-based care to chronic and end-of-life care for heart failure. It also leveraged the combined knowledge of the team, engaging investigators with different skill sets and insights to address CV-related issues facing Canadians. With in-depth knowledge of their local systems and data, investigators were also able to identify and interpret findings relevant to their respective regions and the country as a whole. Some 50 authors contributed to the CCORT Atlas, coordinated by an editorial team composed of me (University of Toronto), Louise Pilote (McGill), William Ghali (University of Calgary), all members of the Canadian Society of Internal Medicine (CSIM), and Susan Brien, a senior research coordinator at ICES. The group managed to overcome many barriers (from gaining access to provincial data sets and ensuring consistency of variables and algorithms, to meeting publication deadlines along with clinical and other professional commitments) during this mammoth project. The findings from the Atlas project have been used by many organizations throughout Canada to improve the quality of health care delivery.

Lessons Learned

A key lesson learned from the CCORT Atlas project involves selecting the "right" types of research projects, that is, those that address an important, novel question that are of appropriate scale and complexity to warrant a team-based approach. The CCORT Atlas was an excellent team project due to its size, scope, and complexity. It required the combined efforts of the entire team, and actually helped the team members to "gel" as they worked together to plan the articles, assemble data sets, conduct analyses, and put pen to paper. It also provided all team investigators with an opportunity to lead an important area of study, as part of a first-ever project, resulting in many peer-reviewed publications.

As noted, KT is part of CIHR's mandate; however, at the beginning of CCORT, little guidance was provided in terms of the types of activities that were expected. Even today, the science of KT remains in its infancy; few proven strategies exist for effective translation and the timely incorporation of clinical evidence within routine care. Despite this, we made a concerted effort to embed KT within all CCORT research activities. For the CCORT Atlas, in particular,

we established a process of preparing media releases, sharing PowerPoint slide collections and, eventually, the complete set of articles via our website, and conducting multiple presentations and workshops at local and national meetings, all of which helped increase awareness and maximize the impact of the Atlas project.

Population-Based, Cluster Randomized Trials: AFFECT and EFFECT

CCORT also conducted two large population-based, cluster randomized trials designed to evaluate the “real-world effectiveness” of hospital report cards for improving care – a controversial topic in the medical field.

In the Administrative Data Feedback for Effective Cardiac Treatment (AFFECT) study, 76 hospitals in Quebec were randomized to receive either rapid or delayed feedback in the form of a confidential report card on their performance on a set of AMI quality indicators, measured using linked administrative databases. The results showed that the confidential report cards had no measurable impact on any of the indicators included.⁴ The study, published in *Journal of the American Medical Association* in 2005, was described as an important contribution to the science of quality improvement in an accompanying editorial.⁵

In the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, 86 participating hospital corporations in Ontario were randomized to either early (January 2004) or delayed (September 2005) feedback of a publicly released report card on a set of 18 CCORT/Canadian Cardiovascular Society AMI and congestive heart failure (CHF) process-of-care quality indicators, derived from chart review.^{6,7} Initial results for the early-feedback hospitals released at a press conference in January 2004 attracted widespread media coverage and reached an estimated audience of over 12 million Canadians (via the media and the web).^{8–10} A survey of participating hospitals, conducted that summer, found widespread awareness of the study’s findings, with more than half of early-feedback hospitals (as well as several in the delayed feedback “control” arm of the study) engaging in initiatives to improve the quality of cardiac care provided. Although the study failed to reach its composite primary end point, several positive secondary outcomes were achieved including lower 30-day and 1-year mortality rates in patients with AMI and lower 1-year mortality rates in patients with CHF with reduced ejection fraction.⁸ Key findings included the observations that 24% of early-feedback hospitals changed their policies to allow emergency physicians to give fibrinolytic drugs directly to appropriate patients rather than waiting for a specialist to make the decision, and that “door-to-needle” times for fibrinolytic therapy were significantly faster in hospitals where this was a routine policy.⁸

Lessons Learned

AFFECT and EFFECT, both landmark studies, demonstrated that it is possible to study important health policy questions using scientifically rigorous designs. As well, the EFFECT study reflected the benefits of a multi-disciplinary team engaged in KT research along with key stakeholders in the health care system, including the Canadian Cardiovascular Society (involved in the design and endorsement of the AMI/CHF quality indicators), CIHR and the Heart and Stroke Foundation of Canada (involved in organizing and co-hosting the EFFECT press conference), and the Ontario Hospital Association (a key partner in disseminating the results to participating hospitals before and after the press conference).

The EFFECT study demonstrated, for researchers, the benefits of working with larger, more established organizations to translate research into practice. We were able to disseminate our research findings much more effectively by working with larger well-established organizations as opposed to trying to

disseminate our research by ourselves alone.

The CCORT website (www.ccort.ca) has also proven to be a very effective KT vehicle as it allows us to publish additional supplementary material (hospital record cards, quality indicator measurement guides, interactive web-based maps, CHF mortality risk model, PowerPoint slides, etc.) to complement material published in traditional peer-reviewed journals. The website received more than 17,000 unique visitors this past year alone.

Conclusion

In summary, CCORT effectively used a team-based research model, incorporating KT, to improve the quality of cardiac care in Canada through innovative health systems and population health research. In recognition of its impact, CCORT was chosen as the recipient of the 2005 CIHR National Knowledge Translation award, and the EFFECT study paper, published in *Journal of the American Medical Association*, was chosen as the 2010 Article of the Year by the CIHR Institute of Health Services and Policy Research.⁸

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