CSCI and the future of clinical health science research in Canada

Stuart M. MacLeod, MD, PhD, FRCPC

Department of Pediatrics, University of British Columbia, BC Children's Hospital Research Institute, Vancouver, BC

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In 2003, Dr. MacLeod became Professor (emeritus since 2014) in the Department of Pediatrics, University of British Columbia and Director of the BC Children's Hospital Research Institute. Previously, he had spent 14 years as a clinical pharmacologist at the University of Toronto and The Hospital for Sick Children and was Dean of the Faculty of Health Sciences, McMaster University 1987–1992. His research interests include pediatric clinical pharmacology, treatments for rare disorders, global health and medical education. From 1984–85, he was President of the Canadian Society for Clinical Investigation.

Half a century ago, clinical medicine was swept up in an extraordinary wave of scientific progress. The mechanisms of disease were rapidly being unraveled and, with increasing understanding of pathophysiology, came optimism for discovery of increasingly effective therapeutic interventions. Practice was steadily evolving from general care to more highly specialized therapies. It rapidly became apparent that medical research, in order to be relevant, needed to progress from basic science, often conducted in isolated traditional disciplines, to a more integrated clinical investigation approach, aimed at exploring and validating new diagnostic and therapeutic tools. This period of rapid progress set the stage for a focus on clinical investigation skills as an essential contribution to the continuing refinement of clinical practice.

In many cases, the clinical investigation skills most highly valued were those associated with bridging the gap between laboratory and bedside. Microbiology moved quickly to embrace the clinical study of infectious diseases. Immunology took on a key clinical role in disciplines such as rheumatology, gastroenterology, nephrology and oncology. Biochemistry and physiology provided a foundation for many fields, including endocrinology and metabolism, respirology and cardiology. Pharmacology and toxicology, important in most medical endeavours, advanced from the study of drug actions to the even more challenging task of evaluating and comparing outcomes, both positive and negative, after institution of novel therapies¹.

It appeared to most observers that, in the long term, clinical research would become the base for integrated scientific research needed to assure optimal medical progress with all its attendant benefits. To a considerable extent, this expectation was reinforced by developments in the complementary bridging discipline of clinical epidemiology that further amplified the need to evolve innovative trial methods, to bring bench to bedside and to apply the rules of evidence to clinical decision-making^{2,3}. Despite the abundant opportunities presented to clinician scientists, competing imbalances in the academic medical environment presented continuing challenges, which were highlighted by Ahrens in 1992 in a compelling discussion of "The Crisis in Clinical Research"⁴.

Now, in 2018, we may well ask if clinical research has fulfilled the aspirations of recent decades. Unfortunately, the honest answer is “only in part”, although, in the Canadian context, nobody can doubt the overall success of the medical research establishment, particularly as represented in the academic domain. In the recent Council of Canadian Academies report on the current state of research and development in Canada⁵, three of Canada’s top five areas of scientific strength are medically related: psychiatry; clinical medicine; and public health and health services. Others in the top 20 areas include earth and environmental science, biology, social sciences and biomedical research. A major part of these activities is closely tied to health sciences and involves clinical investigation. This record attests to the strength of our 17 medical schools and their related academic counterparts in health and social sciences. It does not, however, signify that clinical research, as a discipline, is performing optimally.

While productivity, as reflected in cited publications, may appear robust⁵, there is nonetheless an imbalance in the body of clinical investigation, at least in clinical medicine. The last 50 years have seen rapid increases in specialization in medicine, resulting in a fractionated clinical research environment. The same time frame has also seen a dramatic concentration of both clinical investigation and related research in hospital centres, often resulting in a degree of isolation from foundational basic sciences and relevant social sciences as well as key disciplines such as mathematics and biostatistics that are more likely to have major strengths in university settings.

The role to be played by bridging disciplines has receded in the face of a reductionist drive by narrowly focussed clinical specialists and, at times, because of defensive isolation on the part of university-based scientists. Much of this worrying trend could have been averted were more attention paid to supporting the ideal of an integrated health science centre linking hospitals, universities, community-based practitioners and community agencies. Perhaps progress would have been more substantial had universities and their health science programs had more resources and a vision more closely aligned with their regional and local institutions responsible for the delivery of healthcare services.

The Canadian Institutes for Health Research, working closely with provincial funders, has tried for the past decade to foster patient-oriented research, which would, of necessity, require across the board improvements in the clinical research environment; however, funds have been limited and progress slow in spite of widespread endorsement for the underlying principle.

Some grounds for optimism may be found by tracking the impact of molecular biology advances and human genomics studies in the field of clinical genetics. Probably driven, in part, by enthusiastic expectations for precision medicine, provincial and federal funding bodies have provided resources sufficient to encourage true synergy between basic and clinical researchers and clinicians committed to improving treatment of rare disorders. The reason for success in this highly specialized field may have everything to do with the rarity of the conditions under investigation and the consequent necessity of focusing research and clinical efforts. Similarly, dramatic advances in the diagnosis and treatment of cancer have been fueled by interdisciplinary collaboration between basic, clinical, and population health scientists. Achievement of research harmony in these two fields at least may be a harbinger of an attainable ideal.

The Canadian Society for Clinical Investigation (CSCI) was present at the outset of this evolving environment. The organization was presented with an opportunity to play a lead role in nurturing a critical facet of modern healthcare practice; however, the scientific community interested in clinical investigation has struggled to strike a productive balance between clinical disease specialties and researchers with highly specialized clinical research skills. Too often, clinical investigation has remained the purview of trained clinician physician specialists with limited or inadequate preparation for clinical investigation. With the benefit of hindsight, it may be argued that progress would have been greater had CSCI focused on advocacy for clinical research as a distinct specialty; evolving as required to serve the multiple needs of all health fields. This approach would have promoted a bridging health science orientation rather than a disproportionate medical disease focus and would have supported the active engagement of patients and communities now seen as essential to a productive clinical research milieu.

The CSCI had, and still has, an important role to play as an advocate for the training to provide young scientists with appropriate skills for clinical trial design, measurement of outcomes and epidemiologic and mathematical evaluation of human studies. The challenge in 2018 is to engender recognition of clinical research as a specialty in its own right, with a critical scientific role to play in healthcare improvement. Of course, acceptance of such a role by CSCI would also embody a commitment to promote a new, better integrated vision of academic health sciences with endorsement by all key partners. At a minimum, CSCI should lead in advocacy for new funding to support training of the highly qualified research personnel who will be required to make the desired future a reality.

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CORRESPONDENCE TO:

E-mail smacleod@bcchr.ca