

# **INTERDISCIPLINARY RESEARCH IN THE HEALTH SCIENCES: INAUGURAL SYMPOSIUM OF THE FRIENDS OF THE CANADIAN INSTITUTES OF HEALTH RESEARCH (FCIHR)**

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**A Summary of Proceedings by  
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## **Introduction**

The mandate of the Canadian Institutes of Health Research covers the full spectrum of health research from molecules to populations and from biological systems to social organizations. The CIHR is thus by definition multi-disciplinary in its scope, and its structure and organizing principles are designed to reflect this attribute. The intent however is to go beyond mere multi-disciplinarity (i.e. support of a variety of kinds of health research) to inter-disciplinarity, meaning the support and fostering of research in which investigators from various disciplines interact with each other to tackle important research questions that cannot be addressed effectively otherwise. Creating the conditions and designing the strategies by which interdisciplinary research can flourish are challenging tasks that require a sound understanding of the factors that are either conducive or inimical to its development. These factors include elements that involve funding agencies and the institutions under whose aegis the research is carried out.

The CIHR - an organization that seeks to promote the achievement of the broad aims of the Canadian Institutes of Health Research including its special commitment to interdisciplinary research - organized a symposium to bring together some of the key players involved in fostering interdisciplinary health research. They addressed the topic from two perspectives: the special nature of interdisciplinary research and emerging models for facilitating it.

In his welcoming remarks Dr. Aubie Angel, President of FCIHR, noted: "This is our first conference as a new association and we thought that it was important to encourage our medical schools and our health research institutes and teaching hospitals to facilitate collaborations. We hope that this symposium will help provide a deeper appreciation of the meaning of inter-disciplinarity by examining various challenges and strategies to achieve the expanded mandate of CIHR."

The symposium consisted of two sessions; the first dealing with the challenges inherent in interdisciplinary research and the second with strategies for fostering such research.

The following summary of the proceedings touches only the highlights of the excellent presentations and the lively discussions that took place.

## **Session 1: Dealing with Challenges**

The session was chaired by Dr. Kevin Keough, Chief Scientist in Health Canada, who noted that the creation of CIHR was based on the premise that an agency was needed to support health research at all levels (from molecules to populations) and foster the full range of research strategies including interdisciplinary research. He also observed that, while interdisciplinary research is essential for solving certain kinds of important problems, it involves special efforts to assemble and manage interdisciplinary teams of researchers and an adaptation on the part of researchers to working in a collaborative mode.



## **1.1 Definitions – What is meant by interdisciplinary research and does it make a difference?**

David Naylor, Dean of Medicine, University of Toronto, addressed this question by referring to Rosenfield's classification of research collaboration among disciplines into three types: (Social Science and Medicine, 1992)

- Multi-disciplinary research in which researchers work in parallel or sequentially from a discipline-specific base to address the same problem. The risk being, of course, that one simply may redefine the problem and not make the truly innovative or paradigm-shifting approach required for its resolution.
- Interdisciplinary research in which researchers from two or more disciplines work jointly on a particular problem and collaborate in the design of research strategies and in the analysis of outcomes.
- Trans-disciplinary research in which researchers work jointly from a shared conceptual framework that draws together discipline-specific theories, concepts and approaches to address a particular problem.

Naylor suggested that the failure to develop a shared analytical framework may be a critical limiting factor in realizing the full potential of collaborative research. He then illustrated some of the features of collaborative research by reference to his own experiences in establishing a clinical epidemiology unit consisting of researchers from several disciplines. He used as an example of the benefit of working in an interdisciplinary/trans-disciplinary mode the effort in his unit to address the problem of determining what is a significant clinical difference. The collaboration of a cognitive psychologist, decision scientist and clinical trialists led to an analytical approach (The Treatment Trade-off) that would not likely have emerged otherwise.

Dr. Naylor described the important influence of the evolution of convergence in science as a driver of increasing inter-disciplinarity and trans-disciplinarity. In evaluative clinical sciences, he described how studies on variations in clinical practice led to exploring variations in the incidence and severity of disease and eventually to delineating the social determinants of health status – an evolution in which an ever-widening circle of social scientists and community health specialists were involved.

Similar convergence is emerging in the area of genomics where not only the boundaries between basic biological disciplines are disappearing but where social scientists and geneticists are working together on the societal implications of basic discoveries including the interaction of genetics and the environment and the life-course effects of influences on fetal development. Technological advances (e.g., bioinformatics) also act as a stimulus to convergence of physics, chemistry and biology. Naylor concluded by observing: "This kind of convergence speaks to the way in which, despite our own resistance, sometimes shifts in scientific thinking and transformative paradigms will drive us to be more transdisciplinary than we would have imagined.... In the CIHR, we have a set of structures that are likely to move ..(ultimately).. to a more trans-disciplinary approach. ... I remain optimistic that some of the greatest advances in the next 20 to 30 years will actually come from the convergence of disciplines driven by both new funding structures as well as changes in scientific thinking."

## **1.2 Unique challenges to interdisciplinary research: Effects of discipline, science, culture and region.**

Cam Mustard, Scientific Director, Institute for Work and Health, University of Toronto, illustrated the effects of discipline, science, culture and region by reference to his recent experience as Scientific Director of the Institute. The Institute is non-profit, self-governing, affiliated with three universities in Ontario, and has a staff of about 70 of whom about 20 are scientists. The institute's research mandate is to advance understanding of the causes of disability and illness as they arise in our working lives and to evaluate the treatment of disabilities in order to facilitate productive re-engagement in work life.



Within the institute are a number of clinicians and researchers with expertise in clinical medicine, rehabilitation, epidemiology, public health, biostatistics, sociology, psychology, economics and chiropractic. Mustard noted that the potential for conflict is always present and needs to be managed, including by reminding the various members of the institute of the importance of the common mission and the value of constructively collaborative work in solving complex “real world” problems. Tensions in the organization have arisen around:

- “who owns the territory” surrounding a particular issue – “about whose paradigm is the right one to understand a particular problem”. Mustard noted that interdisciplinary approaches to complex problems require an intellectual environment in which scientists are prepared to accept the possibility that more than one paradigm (“explanation of the world”) may be valid.
- the validity of different research strategies and traditions (randomized controlled trials versus studies where randomization is not feasible) and what constitutes substantive evidence
- the relative value of primary prevention versus secondary prevention

The environment in the institute results in a process of natural selection. Those who can adapt to the interdisciplinary characteristics and the tensions they generate stay on; those who can’t, leave. This has implications for recruitment in that it is desirable to select recruits who are likely to adapt successfully. Clarity of the mission and explicit understanding of the working style are important, as is some prior experience in working with other disciplines.

In closing, Mustard noted the importance of core funding in providing the ability to facilitate interdisciplinary research. He also noted that with CIHR’s commitment to interdisciplinary research “...(one can) now conceive of ways ..(to) .. put problems together in their totality into the peer review process, rather than breaking them up into a series of disciplinary questions.”

### **1.3 When ethical constructs collide.**

Henry Dinsdale, Professor Emeritus, Queen’s University, began with general comments about some of the tensions that have arisen in the context of the industrialization of clinical research as seen in the rapid expansion of clinical trials. He noted that until recently, 80 percent of trials in the United States were conducted in academic medical centers. Currently, only 35 percent are conducted in such centers with a rapidly increasing proportion being done in community practices where the physicians involved are simply acting as patient recruiters with no involvement or responsibility for the scientific direction of the work, its ethical oversight or the manner in which trial results are used.

Dinsdale then noted some of the interdisciplinary tensions surrounding the formulation of the Tri-Council Statement on Ethics Involving Research on Human Subjects and its practical applications. Some of these have to do with the concern that the approaches used in the biomedical sciences may not be suitable for some of the social sciences. He cited the example of the requirement that the research protocol must be for a specific and clearly understood question. Yet some anthropologists and sociologists will argue that in some cases the research question and methodology may have to evolve through an iterative process involving the subjects themselves. Another example of differences in ethical perspective noted by Dr. Dinsdale involved the definition of minimal risk. He observed that the effort to evaluate the Tri-Council Statement’s effects with a view to refining it (including reconciliation of different disciplinary perspectives) lost some momentum when attention had been focused on the creation of CIHR and he called for the effort to be re-energized.

In the final part of his presentation, Dr. Dinsdale mentioned work done by a task force for the National Council on Ethics in Human Research (an organization whose main role is to be a resource for research ethics boards) on the oversight of research ethics boards. The main thrust is on the development of a system of accreditation that would serve to reassure the public that ethical review systems are in place and working effectively. The key elements of the accreditation process are that it is voluntary, peer based, employs sound standards and criteria, operates at arms length from vested interests, is transparent, flexible,



simple and has "buy-in" by major stakeholders. Dinsdale noted that accreditation processes can have an important educational function through which some of the differences in the ethical perspectives of various disciplines can come to be better understood and misunderstandings corrected.

### Discussion Session 1

#### Question (Dorothy Pringle):

Dr. Pringle asked if the existence of special administrative structures such as institutes was a key to successfully moving to a trans-disciplinarity approach.

#### Response (David Naylor):

David Naylor agreed that structural strategies are part of the answer but he observed that other influences were also important. He categorized the drivers of inter-disciplinarity as including:

- structural (e.g., the creation of institutes)
- scientific (when the disciplines change and the boundaries are washed away by innovation)
- incentives (e.g., CIHR, setting up specific competitions and creating funding strategies that promote inter-disciplinarity or transdisciplinarity)

He observed that no single driver may be sufficient or necessary. He cited the convergences going on within existing academic departments in universities.

#### Response (Cam Mustard):

Cam Mustard noted that there are probably several explanations for why these organizations (institutes) popped up outside the universities, in addition to the fact that it is easier to create a convergence of different disciplines in a "green field" situation rather than try to weld it together within the university.

#### Question (Henry Friesen):

Henry Friesen inquired about the emergence of commercial research ethics boards (REBs).

#### Response (Henry Dinsdale):

Henry Dinsdale noted that some commercial REBs are well-established, and respected but we don't know enough about others. He suggested, in particular, that one needs to know if the scientific component of proposals gets as much attention in commercial REBs as in institutionally based REBs. In some countries, and in Alberta, commercial REBs are either prohibited or unnecessary because of special arrangements.

#### Question (Henry Friesen):

Henry Friesen asked if a focus on interdisciplinary research is a detriment to academic career advancement (e.g.; in consideration of promotion and tenure).

#### Response (Cam Mustard):

Cam Mustard indicated that it is too early to tell if career advancement is affected by working researchers in cross-disciplinary areas and it is not yet clear that effective mechanisms exist to evaluate them.

#### Response (David Naylor):

David Naylor agreed and added the particular need to develop a better appreciation of contributions to team research and the multi-author publications that result. He felt that career progress was not blocked by involvement in interdisciplinary work but tended to be slower than the norm for other academics.



**Comment**

The audience member is a cognitive psychologist working in an academic medical centre housing a research institute who holds appointments in two clinical departments. He found the departments to be more supportive of collaborative research than the institute.

**Comment (Raisa Deber):**

Raisa Deber sits on a health research REB and raised a concern about a lack of proportionality in the rules of procedure. The result is that research involving relatively trivial interventions must follow the same procedures as proposals for more complex and serious interventions thereby creating unnecessary impediments.

**Response (Henry Dinsdale):**

Henry Dinsdale suggested that problems of that sort would benefit from ongoing dialogue among institutions and their REBs so that approaches that are effective in providing for proportionality can be widely shared and adopted.

**Question**

The audience member asked Dr. Naylor if universities have been able to adapt their policies on graduate studies to be “truly interdisciplinary”

**Response (David Naylor):**

David Naylor identified several examples within the University of Toronto where interdisciplinary graduate studies were being actively fostered. However he expressed misgivings about the continuation of schools of graduate studies in universities, given an adequate external regulatory environment with a council of graduate studies as an accreditor. He viewed as preferable “driving ..(the control)..down to the front lines of scholarship..(by) vesting the responsibility for graduate studies within faculties and the re-creation of interfaculty graduate programs and interdepartmental programs”.

**Rapporteur's Note:** Not all provinces have external accreditation mechanisms for graduate studies.

**Session 2: New Models**

Chair: Dr. Peter Walker, Dean of Medicine, University of Ottawa

**2.1. CIHR: 21<sup>st</sup> century models**

Dr. Stephanie Atkinson, Member, Governing Council of CIHR, observed that the mandate of CIHR is not only broad in terms of the disciplinary scope but includes the facilitation of the transfer of the knowledge gained to practice, education, advocacy and policy and an evaluation of the impact of the research in improving the health of the population and in contributing to economic growth. The CIHR sees itself as being pro-active, integrated, innovative and competitive. It has evolved an organizational structure that supports central functions (peer review, ethics, partnerships, finance planning, evaluations, clinical research and international linkages) and distributed functions associated with the various institutes (scientific directors and institute advisory boards) and CIHR university delegates. A major feature of all of these groups is their diversity in terms of representing the CIHR's four thematic pillars and various societal sectors (voluntary organizations, government, industry).

Dr. Atkinson described the funding structure of CIHR, the expansion of the membership and the number of peer review committees in order to include representation of the four thematic pillars. She made special note of the fact that the peer review committees are at arms length from both the Governing Council



and from the institutes. The strategic programs of CIHR include those inherited from MRC (HIV/AIDS, human genome, hepatitis C, etc.) and the transition programs established to get the health research community ready for the new CIHR mandate. The latter were illustrated by reference to activities associated with the IHRT (interdisciplinary health research teams) and the CAHR (community alliance health research) programs that were designed to be interdisciplinary from their inception. Going forward, strategic initiatives will be developed at the Governing Council and institute levels. Proposals for such initiatives will be peer-reviewed but likely by special committees to avoid an excessive burden on the regular peer review committees. Both innovations in programming are anticipated in a variety of areas including in capacity building and in industry-related programs that are broad in scope and critically evaluated.

Dr. Atkinson concluded her remarks by identifying two linked major challenges facing CIHR in meeting the objective of being internationally competitive: the realization of the next major tranche of funding from the Government of Canada and convincing Canadians that supporting CIHR is a valuable investment in improving their health status.

## **2.2. From medicare to home and community (M-THAC): A community alliances for health research Project of CIHR**

Prof. Raisa Deber, Director of M-THAC described the project that was officially launched on May 10, 2001. It is based in the Department of Health Management and Evaluation (University of Toronto) and draws researchers from a number of different organizations/universities and variety of disciplinary backgrounds. The objective of the Community Alliances for Health Research (CAHR) program of CIHR is to sponsor excellent research relevant to community groups and agencies. It includes a strong emphasis on training dissemination and partnership. The M-THAC program is one of 19 projects recommended for funding. The funding allocated to M-THAC was \$225,000 per year for 5 years, a sum too small to fully fund research projects. It is therefore being focused on infrastructure to facilitate and disseminate research with a strong emphasis on student training and working with community partners.

Within the overall objective of fostering research and partnership in a way that informs policy and service delivery, M-THAC will examine the effects of moving health care from institutions into the community. The examination will involve three themes:

- \* A systems level analysis of the effects of moving health care from doctors and hospitals to the community.
- \* Evaluation at the level of service delivery (e.g. best practices; supply and demand for services).
- \* Human resource issues.

Professor Deber went on to describe the range of scientific and professional disciplines involved in the project and the three broad categories of partners: national organizations, regional partners in Toronto and other parts of Ontario including professional colleges and both for-profit and not-for-profit service providers, and an international partner. She also described the training programs in which students can be involved either as a research associate on a particular project or as an M-THAC fellow and she outlined M-THAC's role in knowledge dissemination.

Prof. Deber identified lessons learned in developing M-THAC:

- \* The existence of sharply differing views of intellectual property and the implications of such differences for working in a collaborative mode require that this matter be addressed at the beginning of the engagement of researchers in the project.
- \* The need to defend the validity of qualitative research and a broad view of what constitutes valid evidence
- \* In working with partners it is important to guard against promising more than can be delivered; to avoid being co-opted by the special interests of partners; and to make sure that partners understand



that they do not control the results emanating from research, and that in working with them, researchers are not working for them. She emphasized that in any such endeavor, partners need to recognize that this type of integrity is essential or the enterprise has no credibility. Clarity at the outset is essential; the M-THAC partners fully recognize the above points and have been highly supportive.

### **2.3 The Institute of Neurosciences, Mental Health and Addiction (INMHA) of CIHR: Unique challenges and opportunities.**

Dr. Rémi Quirion, Director of INMHA, began by showing a graphic in which the 13 CIHR institutes are portrayed as pieces of a puzzle that must fit together to achieve the interaction that is a central feature of the concept of CIHR. The INMHA is the largest institute in terms of current funding to individual scientists. Its Advisory Board represents a variety of scientific disciplines and voluntary organizations. Dr. Quirion noted that the INMHA covers scientific territory that in the US is covered by 6 National Institutes of Health (NIH) and indicated that the CIHR arrangement was more likely to foster interdisciplinary research than the NIH arrangement. He further observed that in his round of visits to universities across Canada there was great interest expressed by scientists in developing research collaboration across disciplines. Two other important objectives are to enhance training in the field of neurosciences, mental health and addiction, and to assist in reducing the social stigma often associated with brain disease.

Among the challenges facing the INMHA is the very size of the neuroscience enterprise and the fact that there are several excellent scientists in the field in Canada who are not represented in the CIHR database and who need to be integrated into collaborative arrangements. Dr. Quirion felt that meeting the challenge of obtaining cooperation from a variety of disciplines relevant to neuroscience, mental health and addiction was progressing faster than he had expected. He also noted that the challenge of ensuring that the INMHA gets its fair share of resources is likely to be complex but so far there is a generally positive attitude amongst his fellow institute directors and he has identified several opportunities for inter-institute collaboration.

Dr. Quirion described two programs of special note launched by the institute: the Brain Star Program to provide recognition and encouragement to young scientists and a strategic grants program in 4 areas.

### **2.4 Researchers and decision makers: Promoting linkage and exchange.**

Dr. Kevin Smith, Vice-President, St. Joseph's Hospital, Hamilton, expressed the view that fundamental to the success of the research enterprise is still the individual researcher asking an important question with methods that are state-of-the-art and with an infrastructure that allows them to ask those questions in a meaningful way. Decision makers generally do not recognize or care much about the niceties of the distinction between multi-disciplinary, interdisciplinary, and trans-disciplinary types of research. Styles of research are less important to decision makers than the relevance of research outcomes to the kinds of issues about which they must make decisions.

He observed that attitudes about relevance and accountability amongst scientists have changed in recent years. Whereas formerly scientists would claim they are primarily accountable to peers in their respective disciplines, they now often include accountability to funders, to institutions and to the public. This bodes well for building linkages between researchers and decision makers that can not only aid in the knowledge transfer function but can also help in establishing an agenda for policy-relevant research. On the decision maker side, Dr. Smith noted a significant interest in collaborating in the research process in an appropriate way.

It is important to recognize that researchers and decision makers respond to different motivators when it comes to research. Researchers are mainly driven by what they believe to be the scientific importance of a particular line of investigation. A decision maker's interest on the other hand may be sparked by media attention to some untoward occurrence in the health care system that arouses public concern. The



“evidence” used by decision makers includes not only the knowledge acquired through research but also the concerns of the public and a sense of the public acceptability of various potential courses of action.

Dr. Smith identified several strategies for increasing the capacity of decision makers in the health system to understand and promote relevant research including:

- \* building a research component into the training programs for health system managers
- \* adopting a recruitment philosophy - shared by the highest level of institutional governance - that seeks out institutional leadership with a core commitment to evidence-based decision making
- \* creating opportunities for researchers and decision makers to interact and to gain a greater appreciation of their respective cultures and expectations
- \* creating mechanisms for mentorship and career development in policy-relevant research
- \* developing a “marketing plan” that communicates the importance of policy-relevant research for improving the health care system in ways that are suitably tailored to the needs of particular audiences (the public, governments, media, industry, etc.).

Dr. Smith noted that the CIHR could play an important part in implementing one or more of these strategies. There are also opportunities for hospital and university research centres to contribute to linkage and exchange by investing in faculty development focused on interdisciplinary collaboration since the issues confronting the health care system require an interdisciplinary approach.

## Discussion

Professor Deber cautioned against going overboard on inter-disciplinarity. The nature of the research problem should determine what kinds of disciplines are required to tackle it. She stated: “There is still an enormous need for well-trained people working at the fundamental level within a single discipline.... you can’t just have everybody be a jack- of-all-trades.” She also noted that decision makers are often influenced as much or more by values and ideology than they are by objective knowledge and that one cannot assume that decision making is a purely technical enterprise. In response to a query from Dr. Smith she said her comments were not intended to discourage dialogue but were a call for realistic expectations.

Dr. Aubie Angel closed the symposium by thanking the presenters and the discussants for their animated participation. He noted that the topic should be pursued further and in other forums in order to explore fully the evolution of interdisciplinary research. It is also clear Dr. Angel noted that national meetings of organizations central to the academic health sciences enterprise offer excellent venues to discuss opportunities and issues that relate health research to advanced health care. Accordingly, and as part of its mission to promote a robust health research agenda for Canada, the FCIHR will continue to sponsor symposia on timely topics.

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