

The Canadian Initiative on Frailty and Aging

**Howard Bergman MD
François Béland PhD
John Feightner MD
Geoff Fernie PhD
Réjean Hébert MD
David Hogan MD
Chris MacKnight MD
Jean-Pierre Michel MD
Fred Paccaud PhD
Christopher Patterson MD
Christina Wolfson PhD**

**May 7, 2003
(Revised July 24, 2003)**

1. CONTEXT

The Canadian healthcare system is under increasing pressure. As in almost all systems of care in Europe and North America, Canada is faced with the challenge of improving the health of its population and meeting their health and social service needs, particularly those of vulnerable groups. At the same time, the healthcare system must assure quality of care and guarantee equity while striving to be cost-effective.¹

This challenge is being faced within the context of significant transitions.² The most recent Statistics Canada report³ highlights the demographic transition: Among all the developed countries, Canada, along with Japan, has the most rapidly aging population with an increase not only in the relative and absolute number of over 65 year olds but particularly in the oldest segment of the population. Indeed, between 1991 and 2001, the population aged 80 and over increased by 41% to 932,000. This number is expected to increase an additional 43% from 2001 to 2011. By then the population aged 80 years and over will have surpassed an estimated 1.3 million.³ As well, there are important urban and rural disparities. The proportion of the Canadian population living in rural areas is about 20%. However, that number rises to 50% for seniors, at least in Atlantic Canada.⁴ People in rural areas have a lower life expectancy⁵ and rural seniors may have more functional impairment.⁶ As well, accessibility to healthcare services for rural seniors is particularly difficult.

This demographic transition is linked to an epidemiological or disease transition resulting in the increasing importance of chronic disease and its consequences. Functional decline is a major health problem, particularly in aging countries⁷. The prevalence of disabilities increases dramatically with age from 30% in those aged 65 to 74, to 50% in the 75-84 age group and 80% for those over 85⁸. The annual incidence of functional decline in community-dwelling people over 75 years old is nearly 12%.⁹

The third transition for healthcare systems has involved the advances in therapeutics and technology and the increasing intensity of medical interventions leading often to improved ability to treat disease but also resulting in greater difficulty in controlling costs.

While a great majority of older people consider themselves to be in good health and lead independent lives, a significant proportion, 10-20% depending on the definition, are considered frail.

Frailty is an emerging, controversial and enigmatic concept. There is agreement that frail older adults are vulnerable and at high risk for a range of adverse health outcomes (acute and chronic illness, falls, disability, mortality) and increased utilization of resources community, hospital, and long-term care institutions.¹⁰

However, there is a wide range of definitions and models of frailty: decreased physiologic reserves and homeostasis¹¹; the complex and cumulative expression of altered homeostatic responses to multiple stresses¹²; episodic loss of capacity due to illness and other insults not followed by complete recovery¹³; disabilities in IADL and ADL¹⁴; the accumulation of chronic diseases^{15,16}; a state of muscular weakness and other widely distributed secondary losses initiated

by decreased levels of physical activity¹⁷; a clinical syndrome defined by weight loss, exhaustion, weakness, slow walking speed and low physical activity¹⁸; the risk that older persons have, at one point in their lives, of developing or worsening functional limitations or disabilities given the combined effect of deficiencies and modulating factors¹⁹. Various biological (genetic, inflammatory, hormonal, oxidative stress) and socioeconomic underpinnings have been postulated. Socioeconomic, psychological, and health behavior risk factors have been described.

Although there may be debate on the concept of frailty, there is no doubt about the impact of frailty on the older individual, the family, particularly those involved in care giving, as well as on society as a whole. This sector of the population, because of its characteristics, requires a complex combination of medical and social and support systems. Built on the premise of the treatment of acute medical problems, the Canadian healthcare system is characterized by unmet needs, difficult accessibility, fragmentation in the organization of delivery of care, including the cleavage between medical and social services, questionable quality of care and inappropriate utilization of resources.²⁰ The cost of care for older people with disabilities is exponentially related to their level of disability.²¹ For example, it has been estimated that 30% of the budget for all health and social services is accounted for by the care for older persons with disabilities who comprise approximately 20% of the older population or only 3% of the entire population.

This has led to a debate on the impact of the growing number of old and old-old in our population and the ensuing increasing absolute numbers of older persons with disability. It also raised fears and uncertainty for many Canadians: Will I inevitably become sick and dependant in my old age or is there something I can do? Will there be somebody to care for me? Will the services I need be available? Will I be able to afford them? Will this situation “break the bank” of our healthcare and social support system?

As daunting and complex as the challenge may appear, evolving research may indicate the direction to take. From a research perspective, there a growing body of knowledge on: basic biological and social mechanisms; prevalence and risk factors at the population level; markers for early (possibly pre-clinical) detection and diagnosis; population health and social interventions; clinical interventions in the detection, prevention, treatment, rehabilitation and care of frail older persons, including the use of technology; organization of services in the healthcare system.

At the population and societal level, there is increasing evidence that education, prevention, and the promotion of healthy lifestyles (nutrition, exercise, social/intellectual activity, etc.) starting from an early age and continuing into the older population, may promote the development of healthy aging and reduce the incidence of frailty and the number of years of dependency.¹¹ Secondary prevention with screening and treatment of hypertension, diabetes, heart disease, osteoporosis, etc. with progressing therapeutics and technology plays an important role.

As well, evidence suggests that systematic health and social service interventions in the frail elderly population may have a significant impact on health outcomes, quality of life, patient and caregiver satisfaction, pattern of hospital and nursing home utilization and cost. “The horse is not out of the barn” Functional decline is not an inexorable process in frail older people and rehabilitation could make significant change in the functional state of these people. Thus, any

improvement or stabilization of functional decline could generate huge benefit for the health care system.

Interventions, either at home or in institutions, for supporting frail and disabled older people can be developed in order to better support the care and relief caregiver's burden. Introduction of new technologies to assist or supervise physically or cognitively impaired people could have an important impact on the quality of life of both caregivers and care-receivers.

Given the potential benefits of the prevention and management of frailty, the question is how to translate these goals into a coherent system of health and social services. This has been the basis of the quest for integration. Results of demonstration projects in Canada²² point to the potential of integrated delivery systems which align administrative and funding mechanisms with clinical goals to enhance access, availability and quality of care and ensure the appropriate use of resources without increasing costs.

While Canada has been at the forefront in research in understanding frailty, there are important steps that need to be taken in order to develop health and social policy which will lead to: improvement in the patterns of lifestyle and health behavior of Canadians; development of innovative approaches in the prevention, treatment and care of frail older Canadians; operationalization of models of organization of care which are cost-efficient and which meet the needs of older Canadians and their caregivers.

This can be achieved by systematizing our understanding of present and evolving research and translating this growing body of evidence into health and social policy in order to promote healthy aging and reduce the incidence and the impact of frailty in the Canadian population.

2. FRAMEWORK

At the present time, there is no universally accepted model or definitions of frailty. We will not begin the initiative by debating and adopting a model. A consensus on frailty will emerge through the process of the critical review of the evidence and exchange among Canadian and international investigators. We advocate an integrative approach that includes the biological, social, clinical (including cognitive), psychological and environmental components which interact across a person's lifespan and which may delay or promote the emergence of frailty.

FRAILTY
Working Framework for Review

<u>Stages</u>	<u>Early and adult life</u>	<u>Pre-symptomatic</u>	<u>Pre-frail</u>	<u>Frail</u>	<u>Adverse outcomes</u>
Identification	Genetic Biologic Psychosocial determinants	<ul style="list-style-type: none"> • Risk factors • Markers 	<ul style="list-style-type: none"> • Early diagnostic criteria • Risk factors 	<ul style="list-style-type: none"> • Diagnostic criteria • Risk factors (for progression, adverse outcomes) 	
Objectives	Prevent/delay onset	Prevent/delay onset Reduce adverse outcomes	Prevent/delay onset Reduce adverse outcomes	Reduce adverse outcomes/improve quality of life for frail older person and caregiver	Disability Morbidity Hospitalization Institutionalization Death
Intervention	Population/public health	Risk factor modification/ population/ public health	Management/ Risk factor modification/ Population/ public health	Management/ Risk factor modification/ Population/ public health	

3. GOALS AND OBJECTIVES

The overall goals of the Canadian Initiative on Frailty are:

- a. Improve the understanding of the causes and trajectory of frailty in the context of the demography and the epidemiology of the older population over the next 20 years
- b. Promote wellness and improve quality of health care and life for older Canadians through prevention, treatment, rehabilitation, environmental adaptation and cost-effective organization of the delivery of care

The specific objectives are:

- a. **Propose a research program on frailty:**
 - Summarize the present state of research on frailty and disability in older persons in order to lay down the framework and to identify the priorities for further development of research
 - propose a major research program on frailty integrating the four Canadian Institutes on Health Research (CIHR) themes of research: biology, clinical, population, health services (basic mechanisms, risk factors, prevention, diagnosis, treatment, rehabilitation, environmental adaptation, health services delivery, health and social policy)

- b. Propose to primary care providers and specialists (physicians, nurses and other health care professionals) evidence based guidelines on interventions, including the use of new technologies, which may prevent, delay or slow progression of frailty.
- c. Propose realistic policy recommendations to decision-makers and managers
 - Health and social framework and policy that includes but extends beyond the healthcare system e.g. education, social activity, housing, nutrition, pension reform
 - Health promotion and prevention
 - Public awareness and education
 - Innovative and community-based models of organization and delivery of care that are cost-effective
- d. Develop a greater awareness in the population of the role of lifestyle, positive health behavior and prevention at all ages in promoting healthy aging and in preventing/delaying frailty

The process will be based on:

- a. Collating, reviewing and identifying gaps in existing Canadian and international research
- b. Obtaining input from decision-makers, managers, health /social care providers in the public, voluntary, non profit and private sectors
- c. Developing and implementing a strategy to obtain input from older persons and their organizations
- d. Comparing the Canadian experience and expertise in the international context

In particular, this initiative will be closely linked to the emerging Canadian Longitudinal Study on Aging (CLSA). This initiative will be developed in close collaboration with European colleagues. As well, links have been established with the developing National Institute on Aging/American Geriatrics Society frailty initiative.

4. The Time Frame

The time frame for the Canadian Initiative on Frail Older Persons is 4 years beginning in the fall of 2002

Phase 1: (fall 2002 - winter 2004)

- a. Collate, critically review and synthesize the evidence and identify the gaps in the literature in existing and emerging Canadian and international research on frailty

- b. Hold a Canadian investigator meeting to reach consensus on the framework for discussion on the present state of our knowledge and key issues for future research
- c. Lay the groundwork for the international working meeting

This phase will include a meeting of key Canadian investigators to be held in the winter of 2004. The specific objective of the investigator meeting will be to reach consensus for the framework of discussion on frailty, review the evidence and identify the gaps.

Phase 2: (winter 2004 – winter 2005)

Organization of an international working meeting of investigators including health and social policy experts followed by a major publication (joint Canada, Europe, USA initiative)

Phase 3: (winter 2005 – winter 2006)

Knowledge transfer and translation of research

- a. Proposal and grant submission of an integrated research program on frailty by a network of Canadian researchers with input from managers, decision-makers and older persons
- b. Organization of a Canadian Consensus Conference producing
 - Guidelines for health professionals
 - Policy recommendations
 - Social and health policy
 - Organization and financing of care
- c. Dissemination to the Canadian and international community

5. ORGANIZATION

A **Steering Committee** was set up in the fall of 2002:

- Howard Bergman, The Dr. Joseph Kaufmann Professor of Geriatric Medicine and Co-director, Solidage
- François Béland, of the Department of Health Administration at the University of Montreal and Adjunct Professor at McGill University; Co-director, Solidage
- John Feightner, Professor of Family Medicine, University of Western Ontario and Chair of the Canadian Task Force on Preventive Health Care
- Geoff Fernie, Director, Centre for Studies in Aging, Sunnybrook & Women's College Health Sciences Centre

- Réjean Hébert, Professor at the Université de Sherbrooke and Scientific Director of the Canadian Institutes of Health Research Institute on Aging
- David Hogan, the Brenda Strafford Foundation Chair in Geriatric Medicine, University of Calgary
- Chris MacKnight, Associate Professor of Geriatric Medicine, Dalhousie University
- Jean-Pierre Michel, Professor and Chair of the Department of Geriatric Medicine at the Université de Genève
- Fred Paccaud, Professor and Director of the Institut universitaire de médecine sociale et préventive of the Université de Lausanne
- Christopher Patterson, Professor of Geriatric Medicine at McMaster University
- Christina Wolfson, Professor, Department of Epidemiology and Biostatistics of McGill University and Director of the Centre for Clinical Epidemiology and Community Studies

The Canadian Initiative on Frailty and Aging has already received the endorsement and active support of:

- SOLIDAGE: McGill/Université de Montréal Research Group on Integrated Services for Older Persons
- The Dr. Joseph Kaufmann Chair in Geriatric Medicine, McGill
- The Institute on Aging of the Canadian Institutes of Health Research
- The Centre for Clinical Epidemiology and Community Studies, Lady Davis Institute, Jewish General Hospital
- The Geriatric Research Unit, Dalhousie University
- The Division of Geriatric Medicine, McMaster University
- The Brenda Strafford Foundation and Chair in Geriatric Medicine, University of Calgary
- PRISMA (Program of Research on the Integration of Services and the Maintenance of Autonomy)
- Le Centre de recherche sur le vieillissement, Institut universitaire de gériatrie de Sherbrooke
- Centre de recherche, Institut universitaire de gériatrie de Montréal
- Réseau Québécois de Recherche sur le Vieillissement, Fonds de recherche en santé du Québec (FRSQ)
- Centre for Studies in Aging, Sunnybrook and Woman's College Health Sciences Centre, University of Toronto
- The Canadian Geriatrics Society
- The Canadian Task Force on Preventive Health Care
- L'Institut universitaire de médecine sociale et préventive, Université de Lausanne
- Le Département de gériatrie, Université de Genève
- McGill Institute for the Study of Canada
- Department of Geriatric Medicine, Ben Gurion University

International collaborators include, in addition to our Swiss colleagues involved in our steering committee, Jack Guralnik, head of Epidemiology at the National Institute of Aging of the United States; Professor A.M. Clarfield, Chair of Geriatric Medicine at the Ben Gurion University, Israel; Dr. Shelley Sternberg, Israel; Professor Brigitte Santos-Eggimann, Institut de Médecine

sociale et préventive, Université de Lausanne; Professor Shinya Matsuda and Kenji Toba from Japan.

An advisory board of distinguished older persons, as well as decision-makers, professionals, and representatives from voluntary organization industry will be set up as well. Dr. S. O. Freedman, former Dean of the Faculty of Medicine and Vice-Principal of McGill University has agreed to serve as senior scientific advisor.

Staff

Scientific Coordinator:	Michèle Monette
Research Assistant:	Lora Todorova
Program Coordinator:	Rebecca Rupp
Documentalist:	Audrey Attia

6. Funding

The Canadian Initiative on Frailty and Aging is supported by a four year grant from the Max Bell Foundation and as well as with funding from the following organizations:

- The Kaufmann Chair
- SOLIDAGE
- The Geriatric Research Group of Dalhousie University
- The Geriatric Division of McMaster University
- PRISMA
- Le Centre de recherche sur le vieillissement, Institut universitaire de gériatrie de Sherbrooke
- Centre de recherche, Institut universitaire de gériatrie de Montréal
- Réseau Québécois de Recherche sur le Vieillissement, Fonds de recherche en santé du Québec (FRSQ)
- Département de gériatrie, Université de Genève
- Institut de médecine sociale et préventive, Université de Lausanne
- Brenda Stafford Foundation Chair, University of Calgary
- Canadian Geriatrics Society
- Department of Geriatric Medicine, Ben Gurion University

As well, the Canadian Task Force on Preventive Health Care has agreed to provide logistic support for the Review of existing and emerging research to be carried out during Phase I.

-
- 1 World Health Organization. The World Health Report 2000: health systems: improving performance. Geneva; 2000.
 - 2 Commission d'étude sur les services de santé et les services sociaux. "Emerging solutions - Report and Recommendations". (Rapport Clair) 2000.
 - 3 Statistics Canada. Profile of the Canadian population by age and sex: Canada ages. Ottawa: Government of Canada; 7-16-2002. Report No.: 96F0030XIE2001002.
 - 4 Lilley, S. and Capmpbell, J. M. The changing shape of Atlantic Canada 1999. Ottawa: Health Canada; 1999. www.hcsc.gc.ca/hppb/regions/atlantic/documents/pdf/sands_e.pdf
 - 5 Shields, M. and Tremblay, S. The Health of Canada's Communities. Health Reports 2002;13 (supplement):1-24. <http://www.statcan.ca/english/freepub/82-003-SIE/free.htm>
 - 6 St John, P. D., Havens, B., van Ineveld, C. H. M., and Finlayson, M. Rural-Urban Differences in Health Status of Elderly Manitobans. CJRM 2002;7:89-93.
 - 7 Hébert, R. Functional Decline in Old Age. Can Med Assoc J 1997;157:1037-45.
 - 8 Saucier, A. Le portrait des personnes ayant des incapacités au Québec en 1986. Québec: Direction de l'évaluation, Ministère de la santé et des services sociaux; 1992
 - 9 Hebert, R., Brayne, C., and Spiegelhalter, D. Incidence of Functional Decline and Improvement in a Community-Dwelling, Very Elderly Population. Am.J Epidemiol. 5-15-1997;145(10):935-44.
 - 10 Hogan, D.B., MacKnight C., Bergman H. on behalf of the Canadian Initiative on Frail Older Persons. Models, Definitions, and Criteria of Frailty. Manuscript
 - 11 Fried, LP. Frailty. In: Hazzard RR. Bierman E. Blass J. Ettinger W. ed. New York. NY: McGraw Hill: 1994:1149-1155
 - 12 Hammerman D. Toward an understanding of frailty. Ann Intern Med. 1999;130:945-950
 - 13 Buchner, DM and Wagner, EH. Preventing frail health. Clinics in Geriatric Medicine. 1992;8(1):1-17
 - 14 Rockwood, K., Fox, RA., Stolee, P., Robertson, D., Beattie, BL. Frailty in elderly people: An evolving concept. Can Med Assoc J. 1994;150(4):489-504
 - 15 MacAdam, M., Capitman, J., Yee, D. et al. Case management for frail elders: the Robert Wood Johnson Foundation's Program for Hospital Initiatives in Long-Term Care. Gerontologist. 1989;29:737-744

-
- 16 Winograd, CH. Et al. Targeting the hospitalized elderly for geriatric consultation. *J Am Geriatr Soc.* 1998;36:1113
 - 17 Bortz, WM. A conceptual framework of frailty: a review. *Journal of Gerontology: Medical Sciences.* 2002;57(5):M283-M288
 - 18 Fried, LP., Tangen, CM., Walston, J., Newman, AB., et al. Frailty in older adults: Evidence for a phenotype. *The Journals of Gerontology.* 2001: (56A):3:M146-M156
 - 19 Lebel, P., Leduc, N., Kergoat, MJ., et al. Un modèle dynamique de la fragilité. *L'année g rontologique.* 1999(13):84-94:Paris Serdi  diteurs
 - 20 Bergman, H., Beland, F., Lebel, P., Contandriopoulos, A. P., Tousignant, P., Brunelle, Y., Kaufman, T., Leibovich, E., Rodriguez, R., and Clarfield, M. Care for Canada's Frail Elderly Population: Fragmentation or Integration? *CMAJ.* 10-15-1997:157(8):1116-21.
 - 21 Paccaud, F. Rejuvenating Health Systems for Ageing Communities. *Aging Clin.Exp.Res.* 2002;14: 314-18..
 - 22 Trahan, L. and Caris, P. The system of care and services for frail older persons in Canada and Quebec. *Aging Clin.Exp.Res.* 2002;14: 226-32.