



Centre de recherche  
sur le vieillissement  
Research Centre  
on Aging

Health and Social Services-University  
Institute of Geriatrics of Sherbrooke



# Encr **âge**

VOLUME 8, ISSUE 2, FALL 2006

## In this edition:

- The Health of Elderly Male Family Caregivers .....1
- Tissue Engineering: The Sherbrooke Initiative .....2
- What Impact Does Obesity Have on the Physical Capacity of the Elderly? .....3

*This newsletter is intended for people who participated in the Research Centre on Aging's projects.*

*It is also distributed to anyone who wants to receive it. Please contact us for more information.*

## The Health of Elderly Male Family Caregivers

By Francine Ducharme, Ph.D., Chantal Caron, Ph.D. and Diane Girouard, M. Serv.Soc.



**From left to right: Chantal Caron, Francine Ducharme and Diane Girouard.** Francine Ducharme, who headed the study, is a researcher at the Research Centre - Institut Universitaire de gériatrie de Montréal. Chantal Caron, a researcher, and Diane Girouard, a research officer at the Research Centre on Aging of the Health and Social Services Centre-University Institute of Geriatrics of Sherbrooke, were respectively co-researcher and research coordinator for the Estrie region.

**W**hat is the reality of elderly male family caregivers? A study of elderly men providing care at home to their spouses was conducted. Our initial objective was to investigate the adaptation of men to their caregiving role from two perspectives: psychological distress and their perception of their own health. The second goal was to study the factors that could predict whether the men could or could not adapt to such a situation. Finally, we wished to study any changes over time in the intentions of elderly men to have their spouses lodged as well as the factors that help predict such changes. From a service planning perspective for better-adapted services, this study also attempted to uncover the perception of elderly male caregivers of existing services and those that should be implemented to support them.

We recruited men aged 60 and older who act as caregivers for their spouses in four regions of Quebec: Montreal, Quebec City, Estrie, and Saguenay - Lac St-Jean. Resources which provided health, social and community services were of

great assistance for us. Participants were twice interviewed at their homes at 12-month intervals concerning different aspects of their daily lives as caregivers.

The 232 men who participated in the two interviews were aged 72 on average and had 10 years of education. The men had been providing care to their spouses for approximately seven years; 60% of them spent at least 84 hours per week providing care. Thirty-six per cent of the latter had the impression of spending nearly all their time providing care, notably 21 to 24 hours per day. Finally, approximately 40% of the men provided personal care and had to carry out domestic chores and other care-related tasks.

Family and friends were the main sources of support, especially emotional, for male caregivers. Participants experienced few family conflicts over care. Only 12% of the men received no services from the health and social services network. Few of the men resorted to support groups, respite care services\* and meals-on-wheels. Finally, 43% of the men resorted to private services, especially for home cleaning and for respite care.

Spouses who had cognitive impairment (loss of memory, disorientation) also had a greater loss of autonomy in activities of everyday living as well as more depressive and disturbing behaviour. The caregivers spent more time with these women and

\* Examples of respite services: having a person visit a home to allow a caregiver to go out, having the spouse attend a day care centre, placing the spouse in an institution for a limited period of time.

**DID YOU KNOW THAT ...?**  
Nearly 40% of family caregivers in Canada are men and that most of them are elderly spouses. Given that they are themselves aging and are committed to providing care, they are just as physically and mentally vulnerable as their female counterparts.

See **THE HEALTH OF ELDERLY MALE FAMILY CAREGIVERS** on page 4...

# Tissue Engineering: The Sherbrooke Initiative

By Patrick Vermette, Eng., Ph.D.



Patrick Vermette is a chemical engineer specialized in industrial microbiology. He has a master's degree and a doctorate in biomaterial science and tissue engineering. He is a researcher at the Research Centre on Aging and a professor at the Chemical Engineering Department of the Faculty of Engineering of the Université de Sherbrooke.

**One of the goals of tissue engineering is to develop tissues and organs for organ transplants. The culture of functional cells from donors or stem cells cultivated with the aid of three-dimensional matrices is used to form new tissues.**

Tissue engineering is an interdisciplinary science that encompasses biomaterial science, chemical engineering, surface and colloid chemistry (microscopic particles), cell biology, biochemistry, genetic engineering and medicine. Tissue engineering can be applied to tissues or to a variety of organs such as skin or cartilage. Unlike synthetic implants, tissue substitutes are designed to be *bio-interactive* once they are implanted. That means they must respond to the biochemical and biomechanical needs of the tissue or organ that they replace.

However, it is extremely difficult to grow sizable tissues while controlling their properties. When tissue substitutes are too large, cells die because of improper transfer of nutrients and oxygen. Therefore, there is a significant need to develop a strategy to grow sufficiently large tissues for surgical or other uses.

Tissue engineering products face many obstacles when going from lab products to clinical trials. There is a need to develop regulated processes that will make it profitable to market these biological products.

**DID YOU KNOW THAT...**  
The origins of transplantation date back to Antiquity (Chimeres). In the 16<sup>th</sup> century, Gaspari Tagliacozzi developed a rhinoplasty technique. He stretched a piece of skin from the forearm and stuck it onto his patient's face. The *operation* took place while using various slings which held the arm up during the growth of the graft. That's how the first recorded skin graft made history.

## Tissue Engineering Initiative in Sherbrooke

Our interdisciplinary team combines the skills and knowledge of a variety of fields required to lead international-calibre research and development work. Twelve graduate students, many interns, a research assistant and three post-doctoral interns are included in our research group. We hope to expand fundamental knowledge and skills in order to develop products derived from tissue engineering and nanotechnologies.

The objective of our research program is to design and develop a process to grow vascularized tissues of sufficient dimensions for clinical use. Creating a tissue in which many blood vessels function would, for example, allow the large-scale manufacturing of pharmacological products.

Our team has developed a system which supports the orientation of the formation of very small blood vessels such as capillaries. Using those microvessels is the only feasible strategy to *nourish* voluminous tissues. It will therefore be possible to create tissues and organs in the laboratory that can be used in the clinical phase and to explore the many applications for medical and biotechnological purposes.

## Concrete Applications of Tissue Engineering: Treating Diabetes and Bedsores

We are entering the second phase of our research program. Our goal is to create an implant that is capable of secreting insulin to alleviate problems associated with the effective treatment of diabetes.

Moreover, we are interested in pressure sores, more commonly known as bedsores. Ms. Heïdi Brochu, a doctoral student on our team, is working with Dr. Pierre-Michel Roy of the HSSC-University Institute of Geriatrics of Sherbrooke to develop a new generation of bio-active bandages to cure these sores, which are common among elderly persons. Knowledge of tissue engineering techniques is combined with those of the medical profession to help the healing of the sores.

Research in our laboratory is divided into four main topics. We create tissue substitutes. We develop clinical diagnosis tools. We develop therapeutic controlled-delivery systems and other bio-active molecules for applications in ophthalmology, tissue regeneration and cancerology. Finally, we produce biomolecules through processes of fermentation.

Patents have already been filed. More will follow in order to protect the intellectual property and discoveries of our laboratory. In the near future, our work will have a trickle-down effect on the regional economy. 🇩🇪

# What Impact Does Obesity Have on the Physical Capacity of the Elderly?

By Danielle Bouchard, doctoral student in gerontology



Danielle Bouchard is a doctoral student in gerontology at the Université de Sherbrooke. She is conducting her work under the supervision of Martin Brochu, Ph.D., and Isabelle J. Dionne, Ph.D., both researchers at the Research Centre on Aging of the Health and Social Services Centre-University Institute of Geriatrics of Sherbrooke.

**H** health professionals agree on two facts: the Canadian population is aging and two out of every three adults are overweight. These two facts will present significant challenges in improving the quality of life of these persons in the future, namely in limiting physical capacity among the elderly.



If the current trend continues, the number of persons aged 65 and older will represent 25% of Canada's population by 2051. Moreover, the prevalence of obesity has been dramatically increasing over the past few decades. The elderly are not immune to

this problem. In Canada, between 1971 and 2004, the percentage of obese adults aged 75 and older has risen from 11% to 24%. In fact, the elderly are more obese than ever.

**DID YOU KNOW THAT...?**

In Canada, 43% of persons aged 65 and older are overweight and more than half of all Canadians aged 75 and older report one or more disabilities.

Obesity has many impacts on health: it increases the incidence of type 2 diabetes, hypertension, cerebrovascular accidents and coronary diseases. The economic drawbacks on the health system are significant. According to a recent summary of literature on the topic, obesity-related costs have now reached those of tobacco.

Obesity-related problems also have a significant effect on musculoskeletal system, physical functioning and mobility. Physical capacity diminishes throughout one's life, but it seems the level of obesity observed with age accentuates this decline.

According to scientific observations, an obese man's physical capacity is similar to that of a man of healthy weight who is 11 years older than he is. For example, an obese 60-year-old man has the physical ability of a 71-year-old man of healthy

weight. Among women, the gap is 16 years. Therefore, an obese 60-year-old woman has the physical capacity of a 76-year-old woman of healthy weight.

Other observations indicate that 41% of men and 45% of women report one or more functional limitations after age 65. Other factors are also put into cause for the reduction in physical capacity and mobility among the elderly: sedentariness, cognitive impairment, age and chronic diseases such as type 2 diabetes.

The combination of *obesity*, *age* and *decline in physical capacity* play a significant role in loss of autonomy among the elderly. Many studies have shown that obesity is associated with certain disabilities such as difficulty going up or down stairs or standing for a lengthy period of time.

Other studies show that the more a person ages, the more obesity becomes a factor that limits his physical capacity. That's why regularly monitoring body composition and physical capacity is important - to improve or maintain the autonomy and quality of life of the elderly who have weight problems.

Our research team is interested in the effects obesity has on the physical capacity of persons aged 65 to 85 living in the community. Although preliminary, our results indicate that the level of body fat is a factor that has a greater influence on physical capacity than reducing the lean body mass associated with aging. For example, obesity levels have a significant impact on walking speed among elderly men and women. Our research team is pursuing its investigative work in order to better understand the relationship between obesity levels and physical capacity among elderly persons. The results of the study will help better identify persons at risk of developing physical disabilities and will promote better lifestyle habits (exercise and diet) to maintain the physical autonomy of elderly persons.



## ...THE HEALTH OF ELDERLY MALE FAMILY CAREGIVERS

perceived more changes in their relation with their spouses (i.e. no longer possible to carry out common projects, problems communicating).

Over time, nearly 66% of the men participating in this study experienced problems adapting to their role as caregivers. Various factors make it possible to predict their psychological distress: a higher level of education; more help related to caregiving tasks; and the perception of a greater burden after a year. Furthermore, an increase in the feeling of personal efficacy throughout the year helps predict the health condition of and a lower level of psychological distress among elderly male caregivers. The caregiver's age, his feeling of confinement and higher levels of gratification (satisfaction) associated with care help predict the probability (likelihood) of having the spouse placed in an institution.

The results of this study are in agreement with those of other studies that show that it is the perception of the caregiving situation, as well as the caregiver's personal resources, that are associated with adaptation to the caregiving process.

Among all participants interviewed, a subgroup of 61 men was selected to participate in further interviews to investigate the perception of services. The results underscore that taking care of a spouse suffering from a cognitive problem is more trying for male caregivers. It is also one of the main reasons they lodge their spouses, despite all the services that are available. It seems that existing services are relevant, but their capacity to adequately satisfy the needs of the caregivers and their accessibility often leaves much to be desired. This can partially explain why they are not used and why people often resort to private services. The absence of continuity is an aspect of the quality of services that appears to be lacking. Nonetheless, the relationship with caregivers appears to be satisfactory when the service is accessible and offered at the right time. Finally, services for caregivers who had their spouses placed in an institution are perceived to be "almost inexistent." The men indicate the necessity to include them in the planning of services, to offer them greater moral support, and to increase the "aid to caregivers" while prioritizing those who have a loved one suffering from cognitive impairment.

With the significant changes that have occurred in the family structure, elderly spouses in the near future will have to provide more care and will need support. This study provides knowledge about the little known reality of this group "at risk" within the healthcare system.†

*Research was conducted thanks to funding by the Canadian Institutes of Health Research, the Alzheimer Society of Canada and the Fonds québécois de recherche sur la société et la culture. We wish to thank the institutions in Estrie which helped recruit male caregivers and which participated generously in this study.*

## Don't miss the upcoming conferences by the Board of Governors:

### Tai chi : stability and movement

By **Hélène Corriveau, Ph.D.**

Physiotherapist; Researcher at the Research Centre on Aging and Associate Professor at the Department of Rehabilitation of the Faculty of Medicine and Health Sciences, Université de Sherbrooke

**Monday, October 30, 2006, at 2 p.m.**

**At the Amédée-Beaudoin  
Community Centre**  
10 Depot St., Lennoxville

### Reviewing our ideas about aging

By **Gilbert Leclerc, Ph.D.**

Researcher at the Research Centre on Aging and Associate Professor at the Psychology Department of the Faculty of Literature and Human Sciences, Université de Sherbrooke

**Tuesday, November 14, 2006, at 2 p.m.**

**At the Amédée-Beaudoin  
Community Centre**  
10 Depot St., Lennoxville

Admission is free for all attendants.



**Centre de recherche  
sur le vieillissement**  
Research Centre  
on Aging

1036 Belvedere S.  
Sherbrooke, Quebec J1H 4C4

Tel.: (819) 821-1170, ext. 2285

E-mail: Nadine.Fortin@USherbrooke.ca

Visit our Web site: <http://www.cdrv.ca>

**Committee: Martin Brochu, Chantal Caron,  
Nadine Fortin, Nancy Leclerc**

If you are moving or no longer wish to receive *Encrâge*, you can contact Lucie Duquette at (819) 829-7131.