camoscope

CaMos
Canadian Multicentre Osteoporosis Study
Étude Canadienne multicentrique sur l'ostéoporose

BONE HEALTH for life

www.camos.org

ISSUE NO. 20 SEPTEMBER 2018

Message from
Dr. David Goltzman, CaMos Co-Principal Investigator

Dr. David Goltzman

In 1995, very little data existed regarding osteoporosis and fractures in Canadians, and most of the available data related solely to hip fractures. In 1996 only 15% of the population was 65 years of age or older, whereas the 2016 census reported that 20% of Canadians were over 64. As early as the 1980s, the Canadian government recognized that fractures were one of the most important causes of disability in the elderly, and that the total direct cost of hip fractures alone (including acute care, long term and rehabilitative care, and costs of physician visits and drugs) would accelerate in Canada as the population of women and men over age 64 increased. The government's decision to support the Canadian Multicentre Osteoporosis Study (CaMos) in 1996 emerged from the realization that a successful program to eliminate or reduce fractures in the elderly depended entirely on a detailed understanding of the dimension of the problem and on determining causes of osteoporosis in Canada and approaches to its management.

The CaMos study is extremely fortunate and grateful to have received government and private funding for over 21 years. We were able to collect 20 years of data (baseline to Year 19) which has allowed us to answer important questions about the demographics, development, risk factors, and outcomes of osteoporosis. These results have been published in over 162 manuscripts in scientific journals. CaMos is also one of very few large osteoporosis and fracture databases that is being used in a wide variety of international research projects, for example in genome wide association studies (GWAS) to investigate the genetics of osteoporosis, to define the microarchitecture of osteoporotic bone and in studies to develop instruments to predict those at increased risk to fracture.

It is with great sadness that I must announce that the last CaMos application to the funding agency of Health Canada i.e. the Canadian Institutes of Health Research (CIHR), for a grant to continue to accrue follow-up data, was not accepted. Funding a pan-Canadian study such CaMos is very costly and very few large grants to support projects such as CaMos, are awarded by CIHR. Our group of superb researchers and their students (MSc, PhD and post-PhD) will however carry on utilizing the existing data for new research projects and continue to publish the results of the analyses in international scientific and medical journals. We plan therefore to persist in providing important information regarding osteoporosis which will continue to be of relevance to patients, health care providers and health policy makers.

I would like to thank our dedicated coordinators, our expert staff at the Montreal Co-ordinating Centre and at the Imaging Centre, and our very talented CaMos Centre Directors, Co-Directors, and Investigators whose broad range of expertise made the study so successful. Above all I would like to express

(see **Message**, page 2) ➤

➤ (**Message** from page 1)

appreciation to our participants for their dedication to and engagement in this critically important study. Their contributions provide an important legacy to promoting understanding and reducing the impact of a highly prevalent and debilitating disease of aging. ◆

The CaMos Bone Quality Study (BQS) Progress and Follow-up

DR. JONATHAN D. ADACHI, *PRINCIPAL INVESTIGATOR AND DIRECTOR FOR THE HAMILTON CAMOS CENTRE*

DR. ANDY KIN ON WONG, *DIRECTOR FOR THE BQS, CO-DIRECTOR OF THE TORONTO CAMOS CENTRE*

Dr. Jonathan Adachi

We would like to thank the hundreds of women from across the 6 CaMos sites who participated in the CaMos Bone Quality Study (BQS). The follow-up for the national portion of CaMos BQS has now been completed, and we appreciate the extra time and effort so many of you committed in order to make this study a success.

Scans on high and low-resolution CT machines and bone density scans (DXA) were completed during the interview phase at the study baseline between 2011 and 2013, and in many cases required multiple visits. In Hamilton, for example, participants traveled to the main CaMos office for their interview, to McMaster University for the low resolution CT scan, and to the Toronto General Hospital for the high resolution CT scan. There were some very memorable excursions to Toronto that were most enjoyable, despite the long hours in traffic! The level of enthusiasm and dedication shown by participants at all sites over the years has been truly amazing and we cannot stress enough how much we appreciate each and every one of you.

The combined fourth and fifth years of follow-up for the BQS were completed in May, 2018 and now that we have completed the follow-up, we are busy entering the remaining data for further analysis. We will continue to work on publications and they will be posted on the **camos.org** website.

As a continuation of our journey to discover the impact of musculoskeletal health changes on fractures, we are planning a follow-up study that will involve a second bone density test, low resolution CT, and functional measurements 5 years after the initial baseline scan and activities. This will be followed by 5 additional years of mailed follow-up in order to get a better idea of how muscle and bone quality, muscle function, and frailty interact in pathways that lead to repeated fractures. It is believed that a more rapid deterioration of musculoskeletal health may be responsible for what many physicians have termed the "downward spiral" leading to repeated insults to bone and eventual disability.

We are truly grateful to all of the participants who took part in our BQS study in addition to their continued participation in CaMos. You are an inspiration to us all! We look forward to more opportunities for follow-up studies in the future. ◆

Recent CaMos Publications

Lower Bone Density, Impaired Microarchitecture, and Strength Predict Future Fragility Fracture in Postmenopausal Women: 5-Year Follow-up of the Calgary CaMos Cohort.

For this study, the researchers used high-resolution peripheral quantitative computed tomography (HR-pQCT) to determine if baseline results predict incident fragility fracture in women; and if women who fractured lose bone faster than those who did not.

The researchers compared the HR-pQCT and bone mineral density (BMD) results of 22 women older than 60 years who experienced a fragility fracture during the 5-year follow-up period with 127 women who did not experience a fragility fracture during the study.

The women who fractured had lower bone quality at baseline than those who did not fracture. However, the annualized percent rate of bone loss was not different between both groups. The results suggest baseline bone density, microarchitecture, and strength rather than change in these variables are associated with incident fragility fractures in women older than 60 years.

Reference: Burt LA, Manske SL, Hanley DA, Boyd SK. (2018) Lower Bone Density, Impaired Microarchitecture, and Strength Predict Future Fragility Fracture in Postmenopausal Women: 5-Year Follow-up of the Calgary CaMos Cohort. J Bone Miner Res. Apr;33(4):589-597

(see **Publications**, page 3) ➤

➤ (**Publications** from page 2)

Combined Hormonal Contraceptive Use and Bone Mineral Density Change in Adolescent and Young Adult Women in a Population-Based Cohort: 2-year data from the Canadian Multicentre Osteoporosis Study (CaMos).

Combined hormonal contraceptives (CHC - oral, vaginal ring, patch) are increasingly used by adolescent and young adult women who are maturing toward peak areal bone mineral density (BMD) and toward achieving adult regular, normal length menstrual cycles with normal ovulation.

We included 527 young women from the CaMos youth cohort, divided by age (16-19 and 20-24) and by CHC use (ever versus never users). At baseline and year 2 follow-up we measured height, weight, and BMD at lumbar spine, femoral neck, and total hip sites. Interviewer administered questionnaires addressed menarche age, cigarette and alcohol use, calcium/vitamin D intakes, physical activity and estrogen dose. We examined associations of CHC use with 2-year BMD change adjusted for variables known to be associated with BMD.

Of 307 women with complete data, 229 (75%) used CHC. Adolescents (16-19 yrs) who never used CHC tended to have greater femoral neck BMD gain. Young women (20-24 yrs) who never used CHC, however, showed a significant decrease in femoral neck BMD. The BMD changes were unrelated to estrogen dose and age at starting CHC.

The adolescent CHC users in this study demonstrated less hip region BMD accrual than non-users. Normal values of peak BMD are considered essential to prevent later-life fracturing osteoporosis.

Reference: Brajic TS, Berger C, Schlammerl K, Macdonald H, Kalyan S, Hanley DA, Adachi JD, Kovacs CS, Prior JC for the CaMos Research Group, (2018) Combined Hormonal Contraceptive Use and Bone Mineral Density Change in Adolescent and Young Adult Women in a Population-Based Cohort: 2-year data from the Canadian Multicentre Osteoporosis Study (CaMos), J Musculoskelet Neuronal Interact. Feb;18(2):227-236.

Osteoporotic fractures and obesity affect frailty progression: a longitudinal analysis of the Canadian Multicentre Osteoporosis Study.

The segment of the population aged 60 years or older is the fastest growing. As the number of people over that age increases, the proportion of those termed frail will also increase. Frailty can lead to adverse health outcomes, such as falls, fractures, hospitalizations, loss of independence, and death.

In a cohort of 7753 CaMos participants aged 50 years and older, the researchers explored the effects of low-trauma fractures, obesity and other modifiable and non-modifiable factors, such as sex, age, physical activity, bone mineral density, antiresorptive therapy, medical conditions, health-related quality of life (HRQL), cognitive status and other factors, on frailty change,.

Rates of change in frailty over 10 years were examined using the CaMos Frailty Index. Incident and prevalent low-trauma fractures were categorized by fracture site into hip, clinical vertebral and non-hip-non-vertebral fractures.

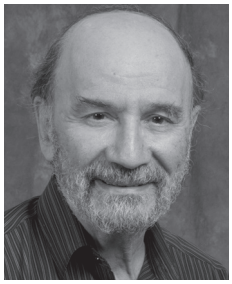
The researchers were able to conclude that older women and men with new vertebral fractures, hip fractures or obesity represent high-risk groups that should be considered for tailored frailty interventions and that greater physical activity and a better quality of life decreased frailty over time.

Reference: Gajic-Veljanoski O, Papaioannou A , Kennedy C, Ioannidis G, Berger C, Wong AKO, Rockwood K, Kirkland S, Raina P, Thabane L, Adachi JD and the CaMos Research Group. (2018) Osteoporotic fractures and obesity affect frailty progression: a longitudinal analysis of the Canadian multicentre osteoporosis Study. BMC Geriatrics, Jan 5;18(1):4 ◆

(see **Message**, page 4) ➤

Message from Dr. Tassos Anastassiades

Chair of the Centre Directors Committee and Director for the Kingston CaMos Centre



Dr. Tassos Anastassiades

On behalf of all Centre Directors, we want to thank you warmly once again for nearly two decades of your faithful participation in CaMos. As most of you are aware, CaMos will not be continued due to lack of funding from the Canadian Institutes of Health Research (CIHR). That is unfortunate as the CIHR scientific committees considered the CaMos project to be worthy of funding, but administratively this type of quite expensive multicenter projects were given low priority.

We are very proud of our participants and all we have learned together about osteoporosis. Much of this knowledge is available through our world-wide scientific publications. Canada is now considered a leader in osteoporosis, which became only possible through your participation. The information that you contributed will hopefully continue to be used as an important knowledge base by researchers, both locally in each centre as well as nationally and internationally, for many years to come. ◆

Regional News

Vancouver Centre

DR. JERILYNN C. PRIOR, DR. SHIRIN KALYAN AND BERNICE LIANG

Dr. Jerilynn Prior

What we have learned through your participation in CaMos over all these years is very valuable. The longer we follow each of you, the more important information we gain. This data is not only unique in Canada, but also worldwide. Even though CaMos was not granted any additional funding to expand this research, we will secure the necessary resources to continue to send you a yearly questionnaire about fractures. We will not be doing any new big questionnaires, bone density tests or bone X-rays.

We are including a consent form asking for your permission to follow you for a further three years.

We have also provided a stamped envelope so you can mail us the signed form. We are highly appreciative of what we've been able to learn together and look forward to continuing to work with you. ◆

Congratulations

2018 Osteoporosis Canada - CaMos Fellowship Award Recipient – Dr. Azita Goshtasebi, MD, MPH, PHD

Dr. Azita Goshtasebi

I am delighted to receive the Osteoporosis Canada (OC)-CaMos Fellowship. I graduated with a Doctor of Medicine from Isfahan University of Medical Sciences, and later with a Master of Public health and PhD in reproductive health from Tehran University of Medical Sciences in Iran. The focus of my research has been on women's reproductive health from a public health perspective. Since moving to Canada, 4 years ago, I have been working alongside Dr. Prior at the Centre for Menstrual Cycle and Ovulation Research studying women's reproduction and bone health especially in adolescent and premenopausal women.

The OC-CaMOS fellowship grant allows us to work on: "Does Peak Perimenopause Bone Mineral Density Predict Risk for Incident Fragility Fractures?" using CaMos data over many years. I will evaluate whether those with lower BMD values just before becoming menopausal are at a greater risk of subsequent fragility fractures than those with higher BMD values. My mentors for this project are Dr. JC Prior, and Claudie Berger. ◆

Thank you to our funding partners

Amgen Canada Inc.

Canadian Institutes of Health Research (CIHR)

Your Regional Centres

Calgary, AB
(403) 220-8236

Halifax, NS
(902) 473-5725

Hamilton, ON
(905) 529-0612

Kingston, ON
(613) 533-6027

Québec, QC
(418) 650-0698
ext. 300

Saskatoon, SK
(306) 933-2663

St. John's, NF
(709) 777-6270

Toronto, ON
(416) 340-4841

Vancouver, BC
(604) 875-5928