CaMos Study and Summary of Data

The Database:

The CaMos database has a wealth of information on a randomly selected population of Canadian women and men, followed for nineteen years. The data consists of repeated questionnaires; including extensive interviewer administered approximately every 5 years and brief mail-in questionnaires administered annually. The emphasis is on factors believed to be important determinants of skeletal health, but a great proportion of the information relates to general health, therapeutic drug use, specific diseases such as breast & prostate cancer, diabetes and cardiovascular diseases, hospitalizations, causes of death and quality of life.

The Cohort:

A second invaluable asset of CaMos is the cohort. Its many unique features make it the best available anywhere for the long-term study of osteoporosis and fracture. The cohort is a randomly selected population from nine centres across Canada that, in terms of ethnicity, education, occupation, and other features closely mimics the population of Canada. It contains men as well as women, a feature not commonly found in other osteoporosis studies. The establishment of the cohort (9423 participants) in 1995-1997, and creation of the study infrastructure has been accomplished at a total cost of $ 4.422 million. Unlike other major studies, the participants are 25 years and older; the age of participants in most other studies of osteoporosis and fracture is > 50 and more often > 65 years. Most importantly, after five years follow-up cohort retention is > 85% and after ten years follow-up cohort retention is > 70%, something rarely achieved in any prospective osteoporosis study.

Young Cohort:

A major objective of the study is to better understand the factors that determine Peak Bone Mass (PBM) and the importance of PBM in delaying onset and/or preventing age-dependent osteoporosis and fracture. In 2004-2005, 1001 young women and men age 16-24 were recruited. Extending the age range of the participants provided invaluable information for the development of a rational and effective program for optimizing bone health and reducing fracture risk because a pillar of that program will undoubtedly be to maximize PBM and delay as long as possible the start of age-dependent bone loss.

Serum, Urine & DNA samples:

We have collected approximately 4700 samples of serum, urine and DNA from CaMos participants. These samples have been used to measure various analytes now known to be important in bone health. We have also participated in DNA studies using current technology and our current understanding of the genetics of metabolic bone disease. As our understanding of the biology of bone and the pathophysiology of metabolic bone disease accumulates the CaMos samples will be used to better describe the specific disease attributes of Canadians and so provide the basis for constantly improving our approach to osteoporosis & fracture prevention.

Collaborative projects:

CaMos is one of very few large osteoporosis & fracture databases that is being used in a wide variety of international research projects designed to develop instruments for those at increased risk to fracture.

ADULT COHORT:

Prospective cohort study of 9,423 non-institutionalized, randomly selected women (n=6539) and men (n=2884) aged 25+ years old.
Selected from a 50-kilometer radius of nine Canadian cities: St John's, Halifax, Quebec City, Kingston, Toronto, Hamilton, Saskatoon, Calgary, Vancouver

Interviewer-administered questionnaire	**Baseline** (1995-1997)	**Year 3*** (1998-1999)	**Year 5** (2000-2002)	**Year 10** (2005-2007)	**Year 16**** (2012-2013)
Socio-demographic information	X	X	X	X	X
Medical history	X	X	X	X	X
Medications and supplements taken on a regular basis	X	X	X	X	X
Fracture	X	X	X	X	X
Reproductive history	X	X	X	X	X
Medical family history	X	X	X	X	X
Tobacco	X	X	X	X	X
Food intake (high in calcium content)	X	X	X	X	X
Physical activity	X	X	X	X	X
Sunlight exposure	X	X	X	X	X
Quality of Life: Torrance and SF-36	X	X	X	X	X
Interviewer's assessment	X	X	X	X	X
Mini Mental State Exam (65+ years old)	X		X	X	X
Disability and Health Status (60+ years old at baseline)			X	X	X
Household income			X	X	X
Fluoride			X	X	X

* participants aged 40 to 60 years at baseline
** men aged 60 to 75 and women aged 60 to 85, at Year 16

Measurements & Images	**Baseline (1995-1997)**	**Year 3* (1998-1999)**	**Year 5 (2000-2002)**	**Year 10 (2005-2007)**	**Year 16** (2012-2013)**
Height and weight	X	X	X	X	X
DXA: L1-L4, femoral neck, total hip, trochanter, ward`s triangle	X	X	X	X	X
TBS[1]				X	Lunar machines only
FRAX, with and without BMD	X			X	
X-ray of the spine (T&L) – aged >=50yrs including GSQ and mABQ assessments	X		X	X	X
Blood, urine, DNA	QC		QC, CA, HA	All except HA	X
Ultrasound of the ankle	X		ST, HX, QC,HA, SK, CA		
Timed "up-and-go" test					X
Grip strength test					X
Hip and waist measurements					X

* participants aged 40 to 60 years at baseline
** men aged 60 to 75 and women aged 60 to 85, at Year 16
[1]Available in a subsample
ST=St John's; HX=Halifax; QC=Quebec City; HA=Hamilton ; SK=Saskatoon; CA=Calgary;

Biospecimens (12 hrs fasting)	**Baseline** (1995-1997)	**Year 3*** (1998-1999)	**Year 5** (2000-2002)	**Year 10** (2005-2007)	**Year 16**** (2012-2013)
DNA	QC		QC, HA, CA	All except HA	X
Urine	QC		QC, HA, CA	All except HA	X
Calcium	QC		QC, HA, CA	All except HA	
Phosphorus	QC		QC, HA, CA	All except HA	
Creatinine	QC		QC, HA, CA	All except HA	
Serum	QC		QC, HA, CA	All except HA	X
25(OH)D	QC		QC, HA, CA	All except HA	
PTH	QC		QC, HA, CA	All except HA	
BAP	QC		QC, HA, CA	All except HA	
CTX	QC		QC, HA, CA	All except HA	
Insulin	QC		QC, HA, CA	All except HA	
Estradiol	QC		QC, HA, CA	All except HA	
Testosterone	QC		QC, HA, CA	All except HA	
Albumin	QC		QC, HA, CA	All except HA	
Calcium	QC		QC, HA, CA	All except HA	
Creatinine	QC		QC, HA, CA	All except HA	
Phosphorus	QC		QC, HA, CA	All except HA	
Urea	QC		QC, HA, CA	All except HA	
Glucose	QC		QC, HA, CA	All except HA	
Vitamin D binding protein	Most recent blood in Y0, 5 and 10				
IGF1	<50 yrs old		<50 yrs old	<50 yrs old & >= 50 yrs old	
Lipids	QC		QC, HA, CA	All except HA	
Sclerostin[1]	QC		QC, HA, CA	All except HA	

* participants aged 40 to 60 years at baseline
** men aged 60 to 75 and women aged 60 to 85, at Year 16
[1]Only one measure per participant. The selection of the participants was based on 1 case (blood before fracture) per 3 controls (no fractures)
QC=Quebec City; CA=Calgary; HA=Hamilton

Follow-up of Adults:

- Year 1, 2, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 17, 18 and 19 (all participants)
- Year 3 (participants less than 40 or older than 60 at baseline)
- Year 16 (participants less than 60, men older than 75 and women older than 85)
- Mailed questionnaire asking about fractures, hospital admissions, surgeries, medications (related to osteoporosis), SF-12 (at Y16 only)

YOUTH COHORT:

Prospective cohort study of 1001 randomly selected young men and young women, aged 16 to 24 years old.
Selected from a 50-kilometer radius of nine Canadian cities: St John's, Halifax, Quebec City, Toronto, Hamilton, Kingston, Saskatoon, Calgary and Vancouver.

Interviewer-administered questionnaire	Baseline	Year 2
Socio-demographic information	X	X
Medical history	X	X
Medications and supplements	X	X
Fracture	X	X
Reproductive history	X	X
Medical family history	X	X
Tobacco	X	X
Food intake	X	X
Physical activity	X	X
Sunlight exposure	X	X
Quality of Life: Torrance and SF-36	X	X
Interviewer's assessment	X	X
Household income	X	X

Measurements & Images	Baseline	Year 2
DXA: L1-L4, femoral neck, total hip, trochanter, ward`s triangle	X	X
Height and weight	X	X

Biospecimens (12 hrs fasting)	Baseline	Year 1	Year 2
DNA	CA	QC	CA, KN, SK, TO, VR
Urine	CA	QC	QC, KN, TO, SK CA, VR
Serum	CA	QC	QC, KN, TO, SK CA, VR
25OHD	CA	QC	QC, KN, TO, SK CA, VR
PTH	CA	QC	QC, KN, TO, SK CA, VR
BAP	CA	QC	QC, KN, TO, SK CA, VR
CTX	CA	QC	QC, KN, TO, SK CA, VR
Insulin	CA	QC	QC, KN, TO, SK CA, VR
Estradiol	CA	QC	QC, KN, TO, SK CA, VR
Testosterone	CA	QC	QC, KN, TO, SK CA, VR
Albumin	CA	QC	QC, KN, TO, SK CA, VR
Calcium	CA	QC	QC, KN, TO, SK CA, VR
Creatinine	CA	QC	QC, KN, TO, SK CA, VR
Phosphorus	CA	QC	QC, KN, TO, SK CA, VR
Urea	CA	QC	QC, KN, TO, SK CA, VR
Glucose	CA	QC	QC, KN, TO, SK CA, VR
IGF1	CA	QC	QC, KN, TO, SK CA, VR

QC=Quebec City; KN=Kingston; TO=Toronto; HA=Hamilton; SK=Saskatoon; CA=Calgary; VR=Vancouver

Follow-up of Youth:

- Year 1 Mailed questionnaire asking about fractures, hospital admissions, surgeries, medications (osteoporosis related)