pressure mat were used to calculate foot structure, as the modified arch index (MAI) during bipedal standing, and foot function, as the center of pressure excursion index (CPEI) while walking using the two-step method. MAI cutoff values were set a priori to create a 3-category foot structure variable: cavus (≤0.030), planus (≥0.164), and referent (>0.030 to <0.164). CPEI cutoff values were also set a priori to create a 3-category foot function variable: pronated (≤7.3), supinated (≥21.0), and referent (>7.3 to <21.0). Sex-specific crude and adjusted (age, BMI [kg/m^2], race) linear regression models were used to determine the association between leg muscle mass and foot symptoms, structure and function. Effect modification between leg muscle mass and age, BMI, sex, or race were examined ($p<0.10$ for interaction was considered statistically significant).

Results: Of the 1,695 participants, 1,018 (contributing 2,009 feet) with complete data were included in this analysis. Thirty-one of the 1,018 participants contributed only one foot to the analysis. Participants were 68% women and 29% African American with a mean age of 68 ± 8.7 years (range 50-95) and mean BMI of 30.5 ± 6.0 kg/m^2. The average leg muscle mass was 10.24 ± 1.66 kg in men and 7.40 ± 1.43 kg in women. Eighteen percent reported foot symptoms. Results of linear regression models are summarized in Table. Associations of leg muscle mass and foot structure differed by sex ($p=0.06$), but no other statistically significant interactions were observed. In men, foot structure was associated with leg muscle mass in crude, but not adjusted, models: lower leg muscle mass was associated with a cavus foot ($p<.0001$) and higher leg muscle mass was associated with a planus foot ($p=0.0012$). Foot function and foot symptoms were not associated with leg muscle mass in men. In women, foot function and foot structure were associated with leg muscle mass in crude, but not in adjusted, models. Pronated foot function ($p=0.02$) and cavus foot structure ($p<.0001$) were associated with lower leg muscle mass; planus foot structure was associated with increased leg muscle mass ($p<.0001$). Foot symptoms were not associated with leg muscle mass in women.

Conclusions: Our results suggest that although leg muscle mass was associated with foot structure and foot function in our bi-racial sample, these relations are attenuated by age, BMI and race. These results highlight the need for future work to examine the role of foot pain, structure and function in understanding other aspects of impairment and physical function.

Betas and standard errors (se) for leg muscle mass and foot symptoms, structure and function

		Foot Function			Foot Structure			Foot symptoms	
		category	beta (se)	p-value	category	beta (se)	p-value	beta (se)	p-value
Men	Crude	pronated	-0.30 (0.25)	0.23	cavus	-0.54 (0.17)	0.001	0.25 (0.27)	0.35
		supinated	-0.05 (0.19)	0.81	planus	1.13 (0.20)	<.0001		
	Adjusted*	pronated	-0.32 (0.23)	0.16	cavus	-0.13 (0.13)	0.33	0.08 (0.21)	0.71
		supinated	-0.22 (0.13)	0.09	planus	0.54 (0.17)	0.002		
	Adjusted†	pronated	-0.36 (0.21)	0.09	cavus	0.03 (0.13)	0.82	0.07 (0.20)	0.73
		supinated	-0.19 (0.12)	0.12	planus	0.17 (0.18)	0.36		
Women	Crude	pronated	-0.27 (0.12)	0.02	cavus	-0.82 (0.09)	<.0001	0.16 (0.14)	0.24
		supinated	-0.01 (0.12)	0.90	planus	1.07 (0.10)	<.0001		
	Adjusted*	pronated	0.01 (0.08)	0.85	cavus	-0.18 (0.07)	0.01	-0.17 (0.08)	0.03
		supinated	0.11 (0.07)	0.11	planus	0.27 (0.07)	<.001		
	Adjusted†	pronated	-0.05 (0.07)	0.44	cavus	-0.06 (0.07)	0.40	-0.07 (0.08)	0.39
		supinated	0.06 (0.06)	0.37	planus	0.06 (0.07)	0.38		

*adjusting for age and BMI
†adjusting for age, BMI and race

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HEART DISEASE IN OSTEOARTHRITIS: HIP VERSUS KNEE AND THE INFLUENCE OF MULTIPLE JOINT INVOLVEMENT AND SEX

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Purpose: Inflammation has been implicated in osteoarthritis (OA) and cardiovascular disease (CVD) pathogenesis, with obesity playing a precursor role. Given known differences in the association between obesity and hip and knee OA, we investigated whether a differential likelihood of reporting CVD existed between these OA cohorts, adjusting for BMI. Further, we investigated whether this likelihood was modified by multiple joint involvement and sex.

Methods: Participants (437 hip; 494 knee) with moderate to severe OA completed measures including CVD, diabetes, high blood pressure, symptomatic joints, height and weight, activity level, age, sex, and education. Sequential logistic regression models were utilized to investigate the association between study measures and reporting CVD. Interactions between knee/hip OA and symptomatic joint count and sex were evaluated.

Results: Knee: age 35-88 years, 65% female, 4% CVD, 14% diabetes, 49% HBP. Hip: age 30-91 years, 55% female, 5% CVD, 8% diabetes, 41% HBP. Overall mean symptomatic joint count was 5 (±4). Adjusted for demographics and health status, no difference in CVD likelihood was detected between cohorts. However, with interactions considered, an increased likelihood was observed for knees among women (Odds Ratios: knee/hip 19.5; symptomatic joint count 1.4; knee/hip*symptomatic joint count 0.6; all $p<0.006$). Further, symptomatic joint count was associated with the likelihood of reporting CVD among hips; odds increased by 25% with each unit increase in symptomatic joint count ($p<0.001$). For an individual with a symptomatic joint count equivalent to the mean among the hip cohort (mean=4), this equates to a nearly 2.5 times greater odds.

Conclusions: The variability in association with CVD between hip and knee OA alongside modifying effects of multiple symptomatic joint involvement and sex likely suggests different OA phenotypes, with potentially varying roles for inflammation and associations with metabolic syndrome. As well, this has implications for OA care, suggesting a need to evaluate CVD and associated risk factors in this population.

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THE RISK OF DEVELOPING DIABETES AMONG INDIVIDUALS WITH OSTEOARTHRITIS: A POPULATION BASED STUDY

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Purpose: Our aim was to determine the risk of incident diabetes among osteoarthritis (OA) patients using population-based administrative data.

Methods: Physician visits and hospital records of a random sample of individuals (n = 600,000) from a population-based administrative database of British Columbia, Canada were analyzed. OA was the main exposure and diabetes was the main outcome of interest. OA and diabetes cases were identified using the case definition of at least two visits to a health professional in two years or at least one discharge from the hospital with ICD-9 code of 715 and 250, respectively. A total of 19,143 existing OA cases in the random sample from 1991 to 1996 were identified after deleting prevalent diabetes cases and up to 3 non-OA individuals (n = 53,365) matched by age, sex, and year of diagnosis were selected as a non-exposed group. Cox proportional hazards (PH) models were used to estimate the hazard ratio (HR) of diabetes after adjusting for patients' history of hypertension, hyperlipidemia, chronic obstructive pulmonary disease, Charlson comorbidity score, body mass index, and socio-economic status (SES).

Results: Over 12 years of mean follow-up, we documented 9,057 new diabetes cases with an incidence rate of 1.05 per 100 person years. At baseline, the mean age of OA patients was 61 years and 60% were women. OA showed statistically significant interactions with age and gender. Both univariable and multivariable Cox PH models were fitted separately for men and women aged 20-64 and 65+ years. Unadjusted and adjusted HRs (95% CI) for diabetes were 1.34 (1.24-1.45) and 1.15 (1.06-1.25), respectively, among men with OA aged 20-64 years. Among women with OA aged 20-64 years, unadjusted and adjusted HRs (95% CI) for diabetes were 1.56 (1.45-1.69) and 1.20 (1.11-1.30), respectively. Adjusted HRs for men and women with OA aged 65+ years were 0.91 (0.81-1.02) and 0.99 (0.90-1.08), respectively which were not significantly different from 1.0.

Conclusion: This study suggests that younger men and women with OA had increased risks of developing diabetes compared to their age and sex matched counterparts. Further studies are needed to confirm our results in other populations and to elucidate the potential biological mechanisms for this increased risk.

Obesity Phenotypes and Symptoms, Function and Knee OA

Outcomes	Normal Weight BMI<25 Met Normal N=640	Normal Weight Met Abnormal N=493	Overweight BMI 25-29.9 Met Normal N=723	Overweight Met Abnormal N=1109	Obese BMI>=30 Met Normal N=475	Obese Met Abnormal N=1229	P value for Met abnormal vs normal	P for Trend
Mean Age	58.2	65.4	57.9	64.6	56.5	61.7	<0.001	0.17
Gender %women	70	68	54	49	61	58	<0.001	<0.001
Race %African American	5.5	8.2	10.4	16.1	20.9	29.1	<0.001	<0.001
K-L Grade (%)								
0-1	75.5	67.6	61.9	54.7	51.9	41.6	<0.001	<0.001
2	17.7	19.4	24.4	25.7	31	34	<0.001	<0.001
3-4	6.7	12.9	13.7	19.6	17	24	<0.001	<0.001
WOMAC								
Scores	4.08	5.68	5.74	7.7	8.99	11.11	<0.001	<0.001
Disability	1.33	1.67	1.91	2.32	2.67	3.17	<0.001	<0.001
PainStiffness	1.02	1.13	1.27	1.44	1.67	1.87	<0.001	<0.001
MSK Symptoms (%)								
Back	36.8	43.3	39.8	46.2	44.9	52.5	<0.001	<0.001
Hand/Wrist	61.6	75.4	54.1	66.3	52.9	64.7	<0.001	<0.001
Shoulder	13.4	12.8	14.2	17.6	14.2	20.3	<0.001	<0.001
Hand Bumps (%) Either Hand	41.2	64.9	35.7	48.7	28.4	43.5	<0.001	<0.001

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CROSS-SECTIONAL RELATIONSHIP OF OBESITY METABOLIC PHENOTYPES, MUSCULOSKELETAL SYMPTOMS, WOMAC SCORES AND KNEE OA: A REPORT FROM OAI

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Purpose: The potential role of metabolic perturbations associated with overweight and obesity and musculoskeletal symptoms, and knee osteoarthritis is under researched. We hypothesized that overweight and obese individuals with metabolic perturbations would have greater musculoskeletal symptoms, worse WOMAC pain,stiffness and disability scores and greater prevalence and severity of knee osteoarthritis.

Methods: The OAI is a multi-center prospective study of persons with or at higher risk of knee OA aged between 45-79. Participants in the Osteoarthritis Initiative at baseline had knee x-rays with KL grading, WOMAC pain , stiffness and disability assessed, BMI determined, waist circumference measured, and self report of presence of symptoms in the back, shoulders, hand/wrist, and hand bumps determined. Metabolic abnormalities were define by the presence of either hypertension, hyperlipidemia or diabetes mellitus defined by self-report or use of medications. Overweight was defined as BMI 25-29.9 kg/m2 and Obesity as BMI >= 30 kg/m2.

Results: 4509 individuals were included in this analysis. The prevalence of knee osteoarthritis, severity of knee OA, womac pain, stiffness and disability scores and frequency of back pain, hand/wrist pain, shoulder pain, and hand bumps were increased by obesity metabolic phenotype in a monotonically increasing manner across weight categories and within each category when metabolically abnormalities were found ($p<0.001$) see table

Conclusions: Compared to normal weight, metabolically benign individuals increasing adiposity and metabolic abnormalities are synergistically associated with worse patient centered outcomes of increasing knee specific pain, stiffness and disability, frequency of pain in variety of other joints , most notably the hand and wrist, and higher prevalence and severity of knee OA. Further studies explorating the mechanisms of these associations and prospective associations are warranted

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INFORMATION NEEDS REGARDING TOTAL JOINT ARTHROPLASTY DIFFER BY GENDER

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Purpose: When medical management of hip/knee arthritis fails, total joint arthroplasty (TJA) is recommended. However, up to one-third of potential TJA candidates are unwilling to consider this surgery. A number of factors have been identified as contributing to unwillingness but no study has evaluated the relative importance of these factors, including whether importance ratings differ by gender. Our study evaluated the relative importance of previously identified correlates of TJA willingness overall and by gender.

Methods: In a cohort with hip/knee OA aged 50+ years, structured interviews were conducted in those who met criteria as 'potential TJA candidates' (WOMAC≥30/96; no surgical contraindications) and indicated being unsure or unwilling to consider TJA. Those with a prior TJA or on a TJA wait list were excluded. Participants provided information on: demographics; concurrent health problems; general health status; and arthritis severity (WOMAC). For each of 18 items (e.g., length of recovery), participants rated the importance of the item from 'not at all important' to 'extremely important' in TJA decision making. Item responses were subjected to exploratory factor analysis. The principle factor method was used to extract the factors, followed by a promax (oblique) rotation. Participants' factor scores were estimated by summing the item scores multiplied by the factor loadings across all items. Multivariable logistic regression model was used to evaluate the relationship between unwillingness to consider TJA (definitely not willing versus probably unwilling or unsure) and factor scores. Multiple linear regression modeling was used to study the relationship between factor scores and gender, controlling for age (50-64, 65-74, 75+ years) and education (<high school, ≥high school).

Results: 631 individuals with hip/knee OA participated (mean age 70 years, 78% female, 54% ≤high school education). Factor analysis identified 4 factors: TJA risks/benefits (5 items - risk of complications, pain early and late post-surgery, function post-surgery, surgery may not help); TJA indications (4 items: age - too old/too young; age - might