MODIFIABLE PREDICTORS OF FUNCTIONAL DECLINE OVER 7 YEARS IN PEOPLE WITH SYMPTOMATIC KNEE OSTEOARTHRITIS. DATA FROM THE MULTICENTER OSTEOARTHRITIS STUDY

B. Østergaard, E. Quinn, M. Nevitt, C. Lewis, J. Torner, D. Felson
	extsuperscript{1}Univ. of Minnesota, Coll. of Health Sci., Minneapolis, MN, USA; \textsuperscript{2}Univ. of San Francisco, San Francisco, CA, USA; \textsuperscript{3}Univ. of Alabama at Birmingham, Birmingham, AL, USA; \textsuperscript{4}Univ. of Iowa, Iowa, IA, USA

**Purpose:** Studies have shown stable or improved physical function over time in people with symptomatic knee osteoarthritis (OA). Most longitudinal studies have included complete cases data only, excluding those with a worse functional trajectory. Including physical function values for missing visits and pre-surgical values of those with total knee replacement (TKR) may identify modifiable predictors of functional decline. The purpose of this study was to identify modifiable predictors for self-reported and performance-based functional decline over 7 years in all those with symptomatic knee OA in a longitudinal cohort. We hypothesized that knee extensor muscle weakness would be significantly associated with functional decline over time.

**Methods:** Subjects with symptomatic knee OA at baseline were included from the Multicenter Osteoarthritis (MOST) Study. We defined tibiofemoral symmetrical knee OA as present when a person had a painful knee with Kellgren and Lawrence (KL) grade $\geq 2$ in that knee. Physical function was measured with the WOMAC physical function subscale, the Chair Stands test, and the 20-meter walk test over 7 years. Predictors included baseline knee extensor isokinetic muscle strength (for symptomatic knee), knee flexion contracture by exam, body mass index (BMI), the Charlson Comorbidity score, the CES-D (depression) score, and baseline WOMAC pain and stiffness. We imputed missing values using 5 multiple imputations. Predicted pre-TKR values just prior to TKR in addition to data from all pre-TKR visits were included for those who got TKR during the follow-up time. We conducted mixed models with the following covariates: age, sex, race, baseline KL grade, and time variable.

**Results:** The 834 study participants with symptomatic knee osteoarthritis at baseline (65.8% females) were on average 62.9 ($\pm 7.9$) years, with a mean BMI of 33.1 ($\pm 7.1$) kg/m$^2$. Modifiable predictors for WOMAC physical function were extensor muscle weakness in the symptomatic knee ($p = 0.004$), higher BMI ($p = 0.001$), pain ($p < 0.000$), stiffness ($p = 0.003$), and knee flexion contracture ($p = 0.023$). Modifiable predictors for the Chair Stands test included knee extensor muscle weakness ($p = 0.000$), higher BMI ($p = 0.000$), pain ($p = 0.002$ for left knee and 0.025 for right knee), and for the 20-meter walk test; knee extensor muscle weakness ($p = 0.000$), BMI ($p = 0.000$), comorbidity ($p = 0.007$), depression score ($p = 0.000$), and knee pain ($p = 0.002$).

**Conclusions:** In the MOST study, knee extensor muscle weakness was significantly associated with self-reported and performance-based functional decline over time in people with symptomatic knee osteoarthritis. Other modifiable predictors were higher BMI, pain, stiffness, and knee flexion contracture. People with symptomatic knee osteoarthritis would benefit from tailored exercises and weight loss programs to prevent functional decline over time.

BONE MINERAL DENSITY AND THE RISK OF KNEE OSTEOARTHRITIS: THE JOHNSTON COUNTY OSTEOARTHRITIS PROJECT

K.E. Barbour, J.M. Hootman, C.G. Helmick, L.B. Murphy, J.B. Renner, J.M. Jordan

CDC, Atlanta, GA, USA; \textsuperscript{1}Dept. of Radiology, Univ. of North Carolina, Chapel Hill, NC, USA

**Purpose:** There is credible evidence that high bone mineral density (BMD) is associated with an increased risk of incident radiographic osteoarthritis (ROA) of the knee. However, less is known about the relationship of BMD with greater clinical and public health relevance, incident symptomatic ROA (sROA).

**Methods:** Using data (N=951) from the Johnston County Osteoarthritis Project’s first (1999-2004) and second follow-up (2005-2010), we examined the association between BMD and both incident knee ROA and sROA among participants aged $\geq 45$ years. Total hip BMD at baseline was measured using dual-energy X-ray absorptiometry. Participants were grouped into sex-specific BMD quartiles because of large sex-specific differences in BMD. Incident knee ROA was defined as development of a Kellgren-Lawrence grade of $\geq 2$ in a knee at second follow-up. Incident knee sROA was defined as onset of both ROA and symptoms in at least one knee at second follow-up. Weibull regression modeling, which accounted for interval censored data, was used to estimate hazard ratios (HR) and 95% confidence intervals (95% CI). Multivariate models adjusted for age, BMI, sex, race, education, smoking, physical activity, and history of knee injury. Median follow-up time was 6.8 (range=4.0-10.2) years. Compared with participants in the lowest BMD quartile, the multivariable adjusted HRs (95% CIs) of sROA for participants in the second, third, and highest tertiles of total hip BMD were 1.4 (0.9 to 2.4), 1.7 (1.1 to 2.7), and 1.6 (1.02 to 2.5), respectively, p trend $=0.03$. Risk of sROA risk did not vary by total hip BMD quartiles, nor was the test of trend significant across BMD quartiles (p trend=0.23).

**Conclusions:** Although high levels of BMD may significantly increase one’s risk of knee ROA, we found no evidence of an association between BMD and the more clinically relevant outcome of knee sROA. These findings suggest that adults can achieve and maintain a healthy BMD without the tradeoff of increasing their risk of the painful and potentially debilitating outcome of sROA.

PROSPECTIVE ASSOCIATION OF SELF-REPORTEDOSTEOARTHRITIS WITH INCREASED RISK OF CORONARY HEART DISEASE IN POSTMENOPAUSAL WOMEN


Warren Alpert Med. Sch. of Brown Univ., Providence, RI, USA; \textsuperscript{1}Mem. Hosp. of Rhode Island, Pawtucket, RI, USA; \textsuperscript{2}Mem. Hosp. of RI, Pawtucket, RI, USA; \textsuperscript{3}Tuts-New England Med. Ctr., Boston, MA, USA; \textsuperscript{4}Univ. of Massachusetts Med. Ctr., Worcester, MA, USA; \textsuperscript{5}Univ. of California at San Diego, San Diego, CA, USA

**Purpose:** Cardiovascular disease and osteoarthritis are two of the most common chronic diseases in older adults. While it is well known that rheumatoid arthritis is prospectively associated with higher rates of coronary heart disease, the association of osteoarthritis (OA) as a risk factor for coronary heart disease (CHD) is less well explored. Notably, there are shared risk factors for both OA and CHD including sedentary lifestyle, metabolic factors and potentially pathobiologic mechanisms such as inflammation and the accumulation of advanced glycation endproducts. However, the few studies that have explored the possible association between OA and CHD have largely been cross-sectional in nature or have evaluated cardiovascular mortality. Therefore, we evaluated whether self-reported osteoarthritis are prospectively associated with an increased risk of incident coronary heart disease in a large cohort of postmenopausal women free of CHD at baseline.

**Methods:** Of the 161,808 postmenopausal women in the Women’s Health Initiative, 96,047 were in the observational study or the placebo arm of the clinical trials and were free of self-reported rheumatoid arthritis, joint replacement, CHD at baseline and answered the question about arthritis and had follow-up information. They comprise the analytic sample. Self-reported OA was defined by two questions; marking yes to the question “Did your doctor ever say that you had arthritis?” and not marking rheumatoid arthritis to the question, “What type of arthritis do you have?”, and as such it is prone to classification bias. Symptomatic OA was defined as having self-reported OA and a positive response to a joint pain or stiffness question as moderate to severe compared to none;