depression: Depressed Affect, e.g. "Felt sad"; Positive Affect, e.g. "Felt hopeful about the future"; Somatic, e.g. "Felt that everything I did was an effort"; and Interpersonal, e.g. "Felt that people disliked me"). Models were then re-specified to improve fit and a final factor structure was selected for each measure and included in a combined CFA model that allowed the factors to co-vary.

Results: Participants were of mean age 76.5 years (range: 64–100); 76.1% were female. For the WOMAC pain subscale, a model that separated the items "At night in bed" and "Sitting or lying" into its own factor had an equivalent fit to a one factor model with correlated item residuals. For the CES-D, dropping the Interpersonal items to give a 3-factor model provided the best fit. A CFA model that incorporated five factors (Fatigue, Pain, Depressed Affect, Positive Affect and Somatic) suggested overlap between the Pain and Somatic scales. The Pain items "Sitting or lying" and "At night in bed" loaded more strongly on Somatic than on Pain. In the final series of CFA models, a new latent factor, "Disturbed Rest", was included consisting of the Pain items "At night in bed" , "Sitting or lying" and the Somatic item "Sleep was restless"; the 3 remaining WOMAC pain items comprised a "Pain on Activity" factor. These new factors did not overlap with each other or the other factors and were only moderately correlated ($r = 0.49$). Disturbed Rest was more highly correlated with Depressed affect than Pain on Activity ($r = 0.45$ vs. $r = 0.28$) and correlated less with Fatigue ($r = 0.45$ vs. $r = 0.58$).

Conclusion: Our findings suggest that the WOMAC pain subscale captures two distinct constructs, pain at rest and pain on activity, and that these two constructs relate differently to depression and fatigue. Pain at rest appears to overlap with the Somatic subscale of the CES-D. Our findings suggest that fatigue, pain and depression in OA may be quantified separately if depression assessment is limited to the Depressed affect subscale of the CES-D.

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RELATIONSHIP BETWEEN KNEE PAIN AND FAT AND MUSCLE MASS _INVESTIGATION BY SEX AND LEVEL OF KNEE DEFORMITY IN GENERAL COMMUNITY RESIDENTS

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Purpose: Although the relation of pain and obesity in knee osteoarthritis is well known, few detailed investigations, including body composition based on Dual Energy X-ray absorptiometry (DXA), have been studied. To elucidate the relationship between knee joint pain and fat and muscle mass, we conducted an investigation with a large-scale cohort of community-dwelling middle-aged and elderly people.

Methods: The subjects were 2,337 men and women (mean age 60.7 ± 12.6 years), 4,750 knees in the Fifth Wave of the National Institute for Longevity Sciences – Longitudinal Study of Aging (NILS-LSA). The subjects were asked about current knee pain on a questionnaire. Knee deformity was then separated into the 5 Kellgren-Lawrence grades based on frontal weight-bearing radiographs of the left and right knees, and divided into three groups: 0-I was no deformity, II was mild deformity, and III-IV was severe deformity. Body mass index (BMI) was also measured, and leg fat and muscle mass were gauged by DXA. Then, using the results for BMI and leg fat and muscle mass, leg fat percentage (leg fat mass/body weight × 100), leg muscle percentage (leg muscle mass/body weight × 100), and the ratio of leg fat mass to muscle mass were calculated. Differences in each indicator depending on the presence or absence of current knee pain were investigated for right and left together in men and women with each level of deformation. Statistical analysis was done using a general linear model, with adjustments for age.

Results: BMI was significantly larger in the group with knee pain in knees with no deformity in women, and in knees with severe deformity in men (each $p < 0.05$). Leg fat percentage was significantly larger in women with in the group with pain, regardless of the severity of deformity (all $p < 0.01$), while in men it was significantly larger only for those with severe deformity ($p < 0.05$). Leg muscle percentage was significantly smaller only in people with pain in the no-deformity and severe deformity groups among women ($p < 0.01$, $p < 0.05$), while in men no significant differences were observed between groups with and without pain, regardless of the deformity level. In women the leg muscle mass to fat mass ratio was significantly smaller only in those

with pain, regardless of the level of deformity, while in men this was true in those with mild and severe deformity (each $p < 0.05$).

Conclusion: This investigation of the relationship between current knee joint pain and fat and muscle mass showed trends for individuals with pain to have higher proportions of leg fat and smaller proportions of muscle, and these trends were more apparent in women.

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PREVALENCE OF KNEE OSTEOARTHRITIS: MATSUDAI KNEE OSTEOARTHRITIS SURVEY 2013, NIIGATA, JAPAN

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Background: Knee osteoarthritis (knee OA) is multifactorial disease. To investigate the relationship between knee OA and various factors, we've conducted epidemiological survey for knee OA at the Matsudai district in Niigata prefecture since 1979. We've done interviews, body measurements and examination by the orthopedic surgeons. Standing AP X-ray of both knees had been taken. We've conducted a survey every three years recently, and additionally performed gait analysis, measurements of muscle strength and calcaneal bone density. This time, 7th survey was held in July 2013.

Purpose: To report an overview of the latest survey and compare the prevalence of radiographic knee OA with 3rd survey in 1993.

Methods: Participants were 722 inhabitants (408 female and 314 male, average age: 67.3 ± 13.1 and 69.1 ± 12.6 years old) (Fig1). They were residents of the district, and all of them were capable of self-walking. After excluding those who have artificial joints, the subjects were 713 inhabitants (400 female and 313 male). The AP X-ray was evaluated according to the Kellgren-Lawrence (K-L) classification and radiographic knee OA was difined as K-L grade of 2 or higher. The prevalence of radiographic knee OA was computed for groups of participants categorized into ten-year age increments. The results of each group were compared using the chi-square test. A P-value of less than 0.001 was considered significant.

Results: The prevalence of radiographic knee OA in the 800 knees of the female and the 626 knees of the male is shown in Table 1. While the prevalence increased with age in both female and male, the prevalence of female was significantly higher than that of male over sixties. In the 3rd survey, the prevalence of female and male were previously reported as 27.7% and 10.9% in their sixties, and 43.9% and 16.8% in their seventies. Comparing with 3rd study, the prevalence of radiographic knee OA in this study were increased in sixties and seventies.

Conclusions: This is a survey for the knee OA long-lasting in one area of Japan. Prevalence of radiographic knee OA increases with age, and that of female is especially high as shown in previous reports. And it is increasing in both female and male comparing with 3rd survey in 1993. Changes of resident's lifestyle could be considered as a cause of the increase. We plan to continue the study of the various examination such as gait analysis, measurements of muscle strength and bone density carried out this time.
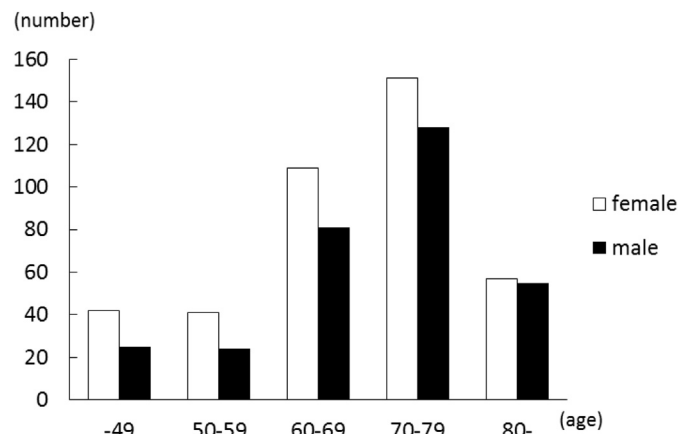

Fig1: Numbers of participants in Matsudai Knee OA Survey 2013

Table1: Prevalence of radiographic OA of the knee, as a function of age and gender

Gender, age range	n (knees)	Radiographic osteoarthritis(%)	Grade 3 or4 changes(%)
Female	800	51.7*	19,4*
~49	84	10.7	0.0
50–59	82	22.0	1.2
60–69	218	43.6*	10.6*
70–79	302	67.9*	26.5*
80~	114	83.3*	47.4*
Male	626	31.3*	7.5*
~49	50	0.0	0.0
50–59	48	12.5	4.2
60–69	162	16.7*	3.7*
70–79	256	38,3*	9.0*
80~	110	59.1*	14.5*

*$P < 0.001$ for differences in prevalence between males and females for each particular age range, and in total.

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PREVALENCE OF KNEE OSTEOARTHRITIS AND IMPACT OF HYALURONIC ACID TREATMENT ON PAIN AND MOBILITY IN A CANADIAN REAL-WORLD POPULATION

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Purpose: Given the paucity of large, real-world datasets for the investigation of knee osteoarthritis, the purpose of this study was to identify and describe the treatment patterns and effects of intra-articular hyaluronic acid (HA) on knee osteoarthritis pain and mobility in a large, Canadian, real-world population.
Methods: This is an observational, retrospective cohort of patients 18 years and older who, between June 1, 1999 and December 31, 2012 had: 1) a diagnosis of knee osteoarthritis identified by ICD9-10 and/or text coding; 2) received at least 1 treatment cycle with intra-articular HA and; 3) complete pain and mobility data [i.e., pain Visual Analogue Scale (VAS) and 6-minute walk test measures] for each treatment cycle. Data came from the Southwestern Ontario (SWO) database, which is a representative primary care, researchable database of over 325,000 unique patient records in Ontario, Canada. The SWO has compiled data continuously beginning from 1999 until present. This database has shown similar prevalence to the Canadian population for several chronic diseases and includes demographic, biometric, laboratory, diagnostic and health resource measures as collected in a primary care setting. Treatments were provided as per usual care of the provider. In addition to demographic data, pain [VAS (0–10 cm) pre and post treatment at rest], and mobility (6-minute walk test in meters) were examined in this study. Differences within and between treatments were compared using paired and independent samples t-tests.
Results: Among 325,000 patients in the SWO database, 20,187 patients had a diagnosis of osteoarthritis of the knee (6.2% prevalence) with 6,618 receiving at least 1 treatment cycle of any intra-articular HA product (33% prevalence). Treatments included Hylan G-F 20 (Synvisc, Genzyme Biosurgery) (43%) and others (57%). Mean age (SD) was 57 (11) years at diagnosis and 71 (18) years at the time of first HA treatment. A high proportion of patients were male (61%), overweight or obese according to standard body mass index cut-points (>80%), had co-morbidities [i.e., diabetes (10%); hypertension (66%); and dyslipidemia (13%)], and were predominantly grade 2–3 on radiographic examination (>75%). On average, patients received between 3 and 8 HA treatment cycles. Among all patients, VAS at rest (weight-bearing) significantly improved following treatment (7.2 cm to 4.1 cm, p < 0.05). Mobility (6-minute walk test) also improved post-treatment (321 m to 423 m, p < 0.05). Comparing Hylan G-F 20 with all other HA treatments, post-treatment VAS at rest (weight-bearing) was significantly lower (3.3 cm vs 4.1 cm, p < 0.05) and distance walked (6-minute walk test) was significantly greater (463 m vs 399 m, p < 0.05).
Conclusions: Osteoarthritis of the knee is a significant problem in primary care affecting pain and mobility. In this Canadian real-world

database, initial analyses indicated that treatment with intra-articular HA may improve pain and mobility. This real-world database may be used as a potential resource for further examination of the effectiveness of HA for reducing pain and improving mobility in knee osteoarthritis.

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MULTIPLE SYMPTOMATIC JOINTS ARE ASSOCIATED WITH INCREASED HEALTH RESOURCE UTILIZATION AMONG PATIENTS UNDERGOING TOTAL KNEE ARTHROPLASTY FOR OSTEOARTHRITIS

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Purpose: Hospitals and surgeons continue to be under increased cost pressure with respect to total knee arthroplasty (TKA), with increasing material costs and decreasing reimbursements. Recent evidence suggests that multiple symptomatic joint involvement in patients with osteoarthritis (OA) may be associated with poorer patient reported outcomes when compared to those who have a single symptomatic joint. However, it remains unclear whether this is associated with any differences in in-hospital resource utilization. The purpose of the present study was to evaluate whether the presence of multiple symptomatic joints is associated with differences in length of stay, discharge disposition, American Society of Anesthesiologists (ASA) class, post-operative adverse event rates, or episode of care costs from the hospital perspective in patients undergoing primary TKA for OA.
Methods: All patients who underwent primary TKA for OA at a single institution between April 2011 and October 2012 were reviewed. Patients with a history of rheumatoid arthritis or inflammatory arthropathy were excluded, as were patients undergoing bilateral procedures. Prospectively collected demographic and clinical data, including number and location of symptomatic joints, as well as ASA class and discharge disposition were extracted. Data were liked with a hospital administrative costing database. Post-operative adverse event rates were tracked prospectively and included in the analysis. Patients were grouped into three categories based on joint involvement: 1) symptoms in the operated joint only, 2) symptoms in a total of 2–4 joints, and 3) five or more symptomatic joints. A total of 245 patients were included, with 35, 99, and 111 in each group, respectively.
Results: Significant differences were seen in mean length-of-stay between patient groups (3.74, 3.96 and 4.19 days respectively; p = 0.042), with longer time to discharge in patients with multiple joint involvement. These differences were maintained when patients discharged to rehabilitation facilities were excluded (p = 0.015), and were not explained by differences in mean patient age (64, 65 and 65 years of age respectively; p = 0.925), the need for stair training before discharge home (93%, 93% and 86% of patients; p = 0.290), or in-hospital adverse event rates (p = 0.315). No significant differences in the proportion of patients discharged to home were identified based on degree of multi-joint involvement (83%, 81% and 76% respectively; p = 0.540). Multiple joint involvement was positively associated with increasing mean ASA class (2.26, 2.33, 2.61 respectively; p < 0.001), but was not correlated with the incidence of in-hospital adverse events (r = 0.012). Increasing joint involvement was associated with significantly greater mean episode of care costs from a hospital perspective (p = 0.024), and this relationship was maintained when the analysis was limited to patients who were discharged home (p = 0.011). Patients with involvement of 5 or more joints accrued an incremental 9% cost burden to the hospital when compared to those with single joint disease ($10,251 vs $9,379 per patient). Assuming a similar nation-wide prevalence of multiple joint symptoms, this represents a total incremental cost burden of $19,500,000 per year to the Canadian health care system based on 2008/2009 nationwide case volumes.
Conclusions: The results of the present study provide evidence of differences in in-hospital health resource utilization following TKA for OA between patients who have multiple symptomatic joints when compared to those with a minimal number of symptomatic joints. These patients appear to have a greater severity of systemic disease as evidenced by greater mean ASA scores, although this did not translate into