did not change had a less severe K/L score. Radiographs showing bone remodeling did not differ from those showing progression or no change, but the numbers were small (Table 1).
Conclusions: If SBA was seen at baseline, over an 8 year period, 67% showed progression or had a TKR. In those knees not undergoing a TKR, we saw a considerable amount of radiographic bone remodelling or no radiographic change. Progression of pathology is not inevitable in knee OA, even if SBA is present.

Table 1: Baseline data on knee basis

	No Change n = 12	Reformation n = 4	Progression n = 6	TKR n = 26
K/L score				
Median (IQR)	3 (2 to 4)	4 (3 to 4)	4 (4 to 4)	4 (3 to 4)
Femoral attrition				
Median (IQR)	0 (0 to 0)	1 (0 to 1)	1 (0 to 1)	0 (0 to 1)
Tibial attrition				
Median (IQR)	1 (1 to 1)	1 (1 to 1)	1 (1 to 1)	1 (1 to 2)
Day pain				
Yes (n[%])	9 (75%)	4 (100%)	4 (100%)	24 (92%)
No (n[%])	3 (25%)	0 (0%)	0 (0%)	2 (8%)
Night pain				
Yes (n[%])	5 (42%)	3 (75%)	3 (50%)	7 (50%)
No (n[%])	7 (58%)	1 (25%)	3 (50%)	19 (73%)

272 EFFECTS OF EXERCISE VERSUS EXPERIMENTAL OSTEOARTHRITIS ON IMAGING OUTCOMES

C.E. Kawcak[1], D.D. Frisbie[1], N.M. Werpy[1], R.D. Park[2], C.W. McIlwraith[1]. *[1]Orthopaedic Research Center, Colorado State University, Fort Collins, CO, USA, [2]Colorado State University, Fort Collins, CO, USA*

Purpose: To identify changes in imaging outcomes in a controlled model of osteoarthritis versus exercise in order to differentiate adaptive and pathologic processes using clinical techniques.
Methods: 16 2-year-old horses were randomly assigned to an exercise control (n = 8) or an exercise osteoarthritis (n = 8) group. All horses had middle carpal joints arthroscopically explored and an osteochhondral fragment was induced in one middle carpal joint of the osteoarthritis group. All horses were treadmill exercised for the duration of the study (91 days). Clinical, radiographic, nuclear scintigraphic, computed tomographic and MRI examinations were performed and outcomes of these analyses were compared between groups. Imaging results were correlated to clinical, biomarker and gross pathologic results. Data were compared between 3 groups of joints: EXC = both joints from exercise control horses; OAC = sham operated joint from the exercise osteoarthritis group; and OAF = osteoarthritis affected joint from the exercise osteoarthritis group. A Mixed model ANOVA was used to analyze outcomes, and Pearson Correlation Coefficient used to evaluate relationships between dependent variables.

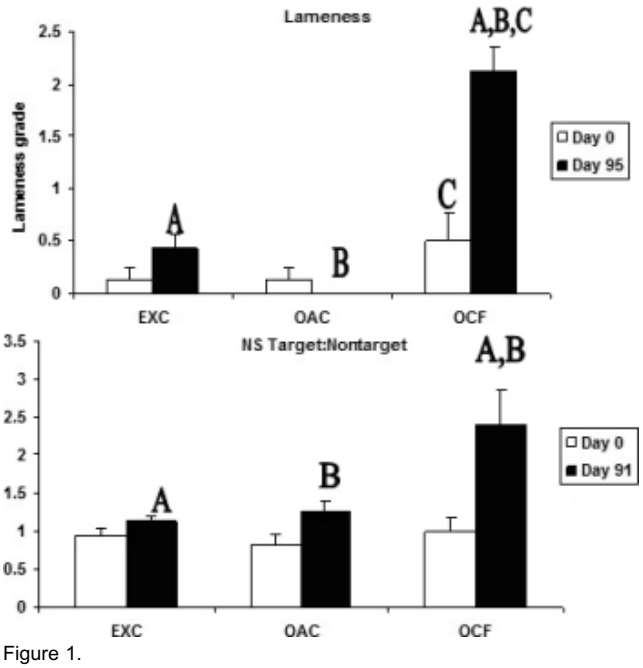

Figure 1.

Results: The osteoarthritis group had significant increases in clinical outcomes and most imaging parameters. Specifically, the osteoarthritis group showed significant increase in lameness, synovial effusion and response to flexion (Figure 1). Radiographic lysis and nuclear scintigraphic uptake were also significantly higher in the osteoarthritis group. There was very little change in subchondral bone density, but a significant change in subchondral bone edema, which was higher in the osteoarthritis group. Radiographic lysis, radial carpal bone edema and nuclear scintigraphic uptake were strongly correlated with clinical changes and radial carpal bone edema was strongly correlated with changes in type I and type II collagen found in the synovial fluid.
Conclusions: Osteoarthritis induced significant changes in imaging parameters beyond the adaptation seen with exercise. Bone edema detected with MRI was closely correlated with collagen biomarkers detected in the synovial fluid.

273 ASSOCIATIONS BETWEEN USES OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS, KNEE CARTILAGE LOSS AND KNEE CARTILAGE DEFECT DEVELOPMENT IN OLDER ADULTS: THE TASMANIA OLDER ADULTS COHORT (TASOAC) STUDY

C. Ding[1], F. Cicuttini[2], G. Jones[1]. *[1]University of Tasmania, Hobart, AUSTRALIA, [2]Monash University, Melbourne, AUSTRALIA*

Purpose: Effects of non-steroid anti-inflammatory drugs (NSAIDs) on knee osteoarthritis (OA) progression are unknown so far. This study is to determine the associations between uses of NSAIDs, knee cartilage loss and knee cartilage defect development over 2.9 years in older adults.
Methods: A total of 419 randomly selected subjects (mean 62 years, range 51−80, and 50% female) were studied. T1-weighted fat-suppressed MRI on right knee was performed, and knee cartilage volume at medial and lateral tibial sites and knee cartilage defects (0−4 scale) were measured at baseline and 2.9 years later. Regular medication uses including conventional NSAIDs and selective cyclooxygenase-2 (COX-2) inhibitors in the last month were recorded by questionnaire. Multivariable linear or logistic regression methods were used for statistical analyses.
Results: Compared with non users of NSAIDs (n = 346), users of COX-2 inhibitors (n = 49) had *decreased* knee cartilage defect development in the medial tibiofemoral compartment (OR 0.39, 95% CI 0.15, 0.99) but no greater loss of cartilage volume ($\beta = -0.03\%$ per annum, pa and +0.88% pa at medial and lateral tibial sites, $P > 0.05$), whereas users of non-selective NSAIDs (n = 24) were associated with *increased* knee cartilage defect development in both medial (OR: 3.07, 95% CI: 1.04, 9.09) and lateral (OR: 2.61, 95% CI: 1.01, 6.77) tibiofemoral compartments, but again no greater loss of cartilage volume ($\beta = -1.09\%$ pa and −1.10% pa at medial and lateral tibial sites, $P > 0.05$). Comparing users of COX-2 inhibitors with users of non-selective NSAIDs, the latter had higher knee cartilage volume loss ($\beta = -4.85\%$ pa, 95% CI: −9.00, −0.70 at medial tibia; and $\beta = -4.61\%$, 95% CI: −8.11, −1.12 at lateral tibia). All models were fully adjusted for potential confounders including knee pain, sex, age, BMI, smoking, steps each day, sun exposure, tibial bone area, radiographic OA, and rheumatoid arthritis.
Conclusions: This study suggests that non-selective NSAIDs may have deleterious effects while selective COX-2 inhibitors may have beneficial effects on knee joint structure. Randomized controlled trials using MRI techniques to confirm the finding are warranted.

274 REDUCED RATES OF PRIMARY JOINT REPLACEMENT FOR OSTEOARTHRITIS IN ITALIAN AND GREEK MIGRANTS TO AUSTRALIA: THE MELBOURNE COLLABORATIVE COHORT STUDY

Y. Wang[1], J. Simpson[2], A. Wluka[1], D. English[2], G. Giles[3], S. Graves[4], **F. Cicuttini[1]**. *[1]Monash University, Melbourne, AUSTRALIA, [2]University of Melbourne, Carlton, AUSTRALIA, [3]The Cancer Council Victoria, Carlton, AUSTRALIA, [4]AOA National Joint Replacement Registry, Adelaide, AUSTRALIA*

Purpose: Racial and ethnic disparities in rates of total joint replacement have been described, but little work has been done in well-established migrant groups. The aim of this study was to compare the rates of primary joint replacement for osteoarthritis for Italian and Greek migrants to Australia and Australian-born individuals.
Methods: 39,023 participants aged 27−75 years, born in Italy, Greece, Australia, and United Kingdom were recruited for a prospective cohort study between 1990 and 1994. The outcome measure was occurrence

of primary hip and knee joint replacement performed for osteoarthritis between January 1, 2001 and December 31, 2005.
Results: Participants born in Italy and Greece had a lower rate of primary joint replacement compared with those born in Australia [hazard ratio (HR) 0.32, 95% confidence interval (CI) 0.26−0.39, P < 0.001], independent of age, gender, body mass index, education level, and physical functioning. This lower rate was observed for joint replacements performed in private hospitals (HR 0.17, 95% CI 0.13−0.23), but not for joint replacements performed in public hospitals (HR 0.96, 95% CI 0.72−1.29).
Conclusions: People born in Italy and Greece had a lower rate of primary joint replacement for osteoarthritis in this cohort study, compared to Australian-born people, which could not simply be explained by factors such as education level and physical functioning, despite being overweight. This may be due to poorer access to health care or social factors and preferences regarding treatment. However, it may reflect ethnic differences in rates of progression to end stage osteoarthritis. Understanding this warrants further investigation.

275 RELATIONSHIP BETWEEN BODY ADIPOSITY MEASURES AND RISK OF PRIMARY KNEE AND HIP REPLACEMENT FOR OSTEOARTHRITIS

Y. Wang[1], J. Simpson[2], A. Wluka[1], A.J. Teichtahl[1], D.R. English[3], G.G. Giles[4], S. Graves[5], **F.M. Cicuttini[1]**. *[1]Monash University, Melbourne, AUSTRALIA, [2]University of Melbourne, Carlton, AUSTRALIA, [3]University of Melbourne, Melbourne, AUSTRALIA, [4]The Cancer Council Victoria, Carlton, AUSTRALIA, [5]AOA National Joint Replacement Registry, Carlton, AUSTRALIA*

Purpose: It is unknown whether adipose mass, distribution of adipose mass, or a combination of both, is associated with the risk of primary knee and hip replacement for osteoarthritis (OA). The aim of this study was to examine this in a cohort study.
Methods: 39,023 participants were recruited for a prospective cohort study during 1990–1994. Body mass index (BMI), waist circumference, and waist-to-hip ratio were obtained from direct anthropometric measurements. Fat mass and percentage fat were estimated from bioelectrical impedance analysis. Primary knee and hip replacement for OA between January 1, 2001 and December 31, 2005 were the outcome measures.
Results: Comparing the fourth with the first quartile, there was a 3 to 4-fold increased risk of primary joint replacement associated with BMI, fat mass, and percentage fat. Waist circumference and waist-to-hip ratio were less strongly associated with the risk. Except for waist-to-hip ratio which was not significantly associated with hip replacement risk, all adiposity measures were associated with the risk of both knee and hip joint replacement, and were significantly stronger risk factors for knee (hazard ratio 1.88 (95% confidence interval 1.76−2.00) for every 5 units increase in BMI) rather than hip replacement (1.26 (1.15−1.38) for every 5 units increase in BMI).
Conclusions: Risk of primary knee and hip joint replacement for OA relates to both adipose mass and central adiposity. This suggests a combination of biomechanical and metabolic mechanism of adiposity measures on the risk of joint replacement, with stronger evidence at the knee rather than the hip.

276 CROSS-CULTURAL ADAPTATION OF THE DUTCH VERSION OF THE FUNCTIONAL INDEX FOR HAND OSTEOARTHRITIS (FIHOA) AND A STUDY ON ITS CONSTRUCT VALIDITY

R. Wittoek[1], B. Vander Cruyssen[1], E. Maheu[2], G. Verbruggen[1]. *[1]University Hospital Ghent, Ghent, BELGIUM, [2]Hôpital Saint Antoine, Paris, FRANCE*

Purpose: The Functional Index for Hand Osteoarthritis (FIHOA) is an instrument designed for assessing functionality in patients with osteoarthritis of the hands. To be used for both clinical research and clinical trials in other countries than French and English speaking countries, the FIHOA needs to be translated and cross-culturally adapted.
This study aimed to validate a cross-culturally translated and adapted Dutch version of the FIHOA in patients with osteoarthritis of the hands and to evaluate the construct validity by comparing the FIHOA with the AUSCAN, another index designed to evaluate functionality in hand osteoarthritis.
Methods: The FIHOA was translated into Dutch and culturally adapted by use of the forward and backward translation procedure (Appendix). The questionnaire was administered to 72 patients with hand osteoarthritis, presenting to the outpatient clinic (female/male ratio: 64/8, hand dominance: right: 62/left: 7/both: 3). A VAS pain scale (100 mm) and the AUSCAN questionnaire were recorded in this cohort as well. An item-item analysis was performed. Test-retest reliability was assessed in 21 patients with the intraclass correlation coefficient and the Bland and Altman method. Construct validity was assessed with the Spearman rank correlation coefficient between the AUSCAN and the FIHOA.
Results: Internal consistency was high (Cronbach's alpha = 0.89). Each of the items from the index could discriminate between a-/mild symptomatic patients and symptomatic patients, as judged by the VAS pain scale, ($p < 0.01$) except for one question ('Are you able to clench the fist?') ($p = 0.05$). The mean total FIHOA scores were statistically significant between the subgroups (mean total score in a-/mild symptomatic group = 7.46 (SD = 6.02) and mean total score in symptomatic group = 14.19 (SD = 6.21), $p < 0.001$).
The Spearman's correlation (rho) between all the subscales of the AUSCAN (pain, stiffness, functionality) and the FIHOA was good, especially for the subscale functionality (rho = 0.82, $p < 0.01$). Test-retest reliability at a 5-day interval was excellent with an intraclass correlation coefficient of 0.96 for the total score. The use of the Bland and Altman method produced a homogeneous distribution of the differences, with no systematic trend observed.
Conclusions: The psychometric properties (test-retest reliability, construct validity and internal consistency) of the Dutch version of the FIHOA were excellent. There was a good correlation between the FIHOA and all subscales of the AUSCAN and especially with the subscale functionality, where it is designed to. The functionality in Dutch-speaking patients with hand osteoarthritis can now be assessed by the FIHOA.

Appendix: Dutch version of the FIHOA

1.	Kan U een sleutel in een slot omdraaien?	___
2.	Kan U met een mes vlees snijden?	___
3.	Kan U met een schaar papier of stof (ver)knippen?	___
4.	Kan U met één hand een volle fles opheffen of omhoog houden?	___
5.	Kan U de vuist volledig sluiten?	___
6.	Kan U een knoop leggen?	___
7.	*voor vrouwen*: Kan U naaiwerk verrichten?	___
	voor mannen: Kan U een schroevendraaier gebruiken?	___
8.	Kan U de knopen van uw kledij vastmaken?	___
9.	Kan U lange tijd schrijven (10 min zonder onderbreking)?	___
10.	Aanvaardt U zonder aarzeling een handdruk?	___

0 = mogelijk zonder moeite
1 = mogelijk mits beperkte moeite
2 = mogelijk mits aanzienlijke moeite
3 = onmogelijk

277 OBESITY AND ADIPOSITY MEASURES ARE ASSOCIATED WITH THE RATE OF PATELLA CARTILAGE VOLUME LOSS OVER TWO YEARS IN ADULTS WITHOUT KNEE OSTEOARTHRITIS

A.J. Teichtahl[1], A.E. Wluka[1], Y. Wang[1], F. Hanna[1], D.R. English[2], G.G. Giles[3], **F.M. Cicuttini[1]**. *[1]Monash University, Melbourne, AUSTRALIA, [2]University of Melbourne, Carlton, AUSTRALIA, [3]The Cancer Council Victoria, Carlton, AUSTRALIA*

Purpose: The aim of this study was to determine whether measures of obesity and adiposity are associated with the rate of patella cartilage volume loss in healthy adults.
Methods: 297 community-based adults aged 50−79 years with no clinical knee osteoarthritis were recruited at baseline (2003−04). 271 (62% female) subjects were re-examined at follow-up (2006−07). Measures of obesity (Body Mass Index (BMI) and weight) and adiposity (fat mass and percentage fat mass), as well as patella cartilage volume, were determined by established protocols.
Results: Patella cartilage volume was lost at an annual rate of 1.8% (95% CI 1.4%-2.1%). Increased baseline BMI, weight, fat mass and percentage of body fat were all associated with an increased rate of patella cartilage volume loss after adjustment for confounders in the total population (all $P \leqslant 0.04$). When males and females were analysed separately, the association between obesity and adiposity measures and the rate of patella cartilage volume loss remained significant for females but not males, although the direction and magnitude of the effect was similar in both groups and the number of females examined was considerably larger. There were no significant associations between change in any of the obesity and adiposity measures and the rate of patella cartilage volume loss.
Conclusions: This study demonstrated that increased measures of obesity and adiposity are associated with an increased annual rate of patella