Methods: knee OA. Changes in cartilage morphology over 12 months in people with medial frontal plane lever arm at the knee and subsequently increasing the centre of mass away from the stance limb, thereby increasing the may drop towards the contralateral swing limb resulting in a shift of the pelvic drop of the stance limb, thereby increasing the frontal plane lever arm at the knee and subsequently increasing the peak knee adduction moment, a proxy for medial compartment loading. The purposes of this study were to examine the relationship between baseline a) hip adduction moment and b) hip abductor strength, and changes in cartilage morphology over 12 months in people with medial knee OA.

Results: Baseline hip adduction moment during walking and hip abductor strength were not associated with either change in medial tibial cartilage volume or progression of medial tibiofemoral cartilage defects or BMLs (Table 1).

Table 1. Relationship between hip adduction moment, abductor strength and change in cartilage

<table>
<thead>
<tr>
<th>Variable</th>
<th>P value</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak hip adduction moment (Nm/(kg*ht))</td>
<td>0.10</td>
<td>0.93 (0.92, 1.05)</td>
</tr>
<tr>
<td>Hip abduction strength (Nm/kg)</td>
<td>0.12</td>
<td>0.72 (0.59, 0.93)</td>
</tr>
<tr>
<td>Progression of Medial Tibiofemoral Cartilage Defects (yes/no)</td>
<td>0.36</td>
<td>1.09 (0.79, 1.51)</td>
</tr>
<tr>
<td>Hip abduction strength (Nm/kg)</td>
<td>0.42</td>
<td>0.93 (0.79, 1.12)</td>
</tr>
<tr>
<td>Progression of Medial Tibiofemoral BMLs (yes/no)</td>
<td>0.63</td>
<td>0.79 (0.65, 0.96)</td>
</tr>
<tr>
<td>Hip abduction strength (Nm/kg)</td>
<td>0.46</td>
<td>0.91 (0.79, 1.06)</td>
</tr>
<tr>
<td>Progression of Medial Tibiofemoral BMLs (yes/no)</td>
<td>0.26</td>
<td>3.78 (0.13, 4.38)</td>
</tr>
</tbody>
</table>

Conclusions: These findings suggest that neither an increased hip adduction moment nor increased hip abductor strength is protective against change in cartilage volume/morphology in medial knee OA. These findings are consistent with recent hip strengthening intervention studies which have found that increased hip adductor strength does not alter the hip adduction moment.

95 KNEE ALIGNMENT MAY INFLUENCE PERI-ARTICULAR BONE MORPHOLOGY

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Purpose: Static alignment influences loading in the knee joint and is a potent predictor of disease progression in those with osteoarthritis (OA). The peri-articular bone has a major role in force dispersion across the knee and changes in its structure, both adaptive and pathological, are prominent in OA. However, the interplay between knee biomechanics and the state of the peri-articular bone is not fully understood. Our objective was to evaluate the influence of static knee joint alignment on peri-articular trabecular morphology measured by MRI and on bone mineral density (BMD) using dual x-ray absorptiometry (DXA).

Methods: This was a cross-sectional analysis of 320 enrollees into the Osteoarthritis Initiative (OAI) Bone Ancillary Study, who received trabecular MRI and peri-articular bone mineral density (pBMD) measurements of one knee at the Ancillary baseline visit (parent study 30 or 36 month visits) who also had comprehensive physical exams at the parent study 24 month visits that included goniometric evaluation of static alignment, where negative values were valgus and positive varus. A correction factor was applied to the physical exam static alignment measures to more closely represent mechanical alignment. Knee and femoral neck DXAs were obtained using GE Lunar Prodigy DXA scanners at the Ancillary baseline. Knee DXAs were used to measure an absolute medial tibial peri-articular bone mineral density (pBMD) and a medial/lateral tibial pBMD ratio.

Trabecular morphometry MRIs were also obtained at Ancillary baseline using 3T MRIs. The medial tibial periarticular bone was analyzed using a customized software package (calcDCN) to provide measures of total bone volume fraction (tBVF), trabecular number, spacing and thickness (Tb.N, Tb.Sp, and Tb.Th).

We performed Pearson’s correlations to evaluate associations of static alignment with trabecular morphometry measures, pBMD, medial/lateral tibial pBMD ratio, femoral neck BMD, age, and body mass index (BMI). We also performed subgroup analyses among those without and with radiographic evidence of OA (Kellgren/Lawrence grade <2 v. ≥2).
Conclusions: Static knee alignment is strongly associated with periarticular trabecular morphometry and periarticular BMD. Knees with greater varus malalignment have morphology consistent with trabecular bone compression. These associations are stronger in those with as compared to without radiographic evidence of OA. These findings suggest that modification of static alignment could alter periarticular bone in knee OA.

96 RISK FACTORS FOR REVISION OF PRIMARY TOTAL HIP REPLACEMENT: A NATIONAL CASE CONTROL STUDY WITH TWELVE YEAR FOLLOW-UP
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Purpose: To examine the relationship between preoperative factors and risk of revision primary THR in the US Medicare population, which to our knowledge has not been previously reported. We will identify the best predictive factors and compare our findings with those from other studies.

Methods: We used a national database of Medicare beneficiaries aged 65 years or older, with a primary THR performed between 1994 and 2004. We identified cases as those with a primary THR followed by a revision THa within 12 years, and controls as those without a revision. We used multivariate conditional logistic regression models to identify risk factors for revision. We also performed a sensitivity analysis using other definitions of revision and controls.

Results: We identified 7,161 cases and 14,322 controls. The most significant risk factors for revision were younger age, female gender, living with others, and a prior history of hip surgery. The risk of revision was also higher for patients with a history of osteoarthritis (OA) and those who received a cemented femoral component.

Conclusions: Our study confirms the importance of preoperative factors in predicting revision of primary THR.

97 SAGITTAL PLANE HIP MOTION DURING GAIT AND FUNCTION AND DISABILITY IN KNEE OSTEOARTHRITIS

Purpose: We aimed to investigate the relationship between sagittal plane hip motion during gait and function and disability in knee OA.

Methods: We used a cross-sectional design to recruit participants with knee OA. We measured sagittal plane hip motion using an optical motion capture system and function and disability using the Western Ontario and McMaster Osteoarthritis Index (WOMAC). We used linear regression models to assess the relationship between hip motion and function and disability.

Results: We recruited 80 participants with knee OA. The mean age was 68 years, 62% were female, and the mean body mass index (BMI) was 29.7. We found a significant inverse relationship between hip flexion and extension and function, with greater hip motion associated with better function. We also found a significant positive relationship between hip motion and disability, with greater hip motion associated with worse disability.

Conclusions: Our study suggests that sagittal plane hip motion during gait is associated with function and disability in knee OA.