**Conclusion:** These data provide detailed insight into the cellular and molecular mechanisms underpinning subchondral bone and BMAT remodeling in OA. An expansion of pre-adipocyte populations along altered function of BMAT adipocytes might represent a previously unrecognized mechanism regulating subchondral bone sclerosis. TFs driving core gene regulatory networks might be promising therapeutic targets for knee OA.

**REFERENCES:**


**Disclosure of Interests:** None declared


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**POSO233**

**COMPARISON OF 3D QUANTITATIVE OSTEOARTHRITIS IMAGING BIOMARKERS: A STUDY USING PAIRED CT AND MR IMAGES FROM THE IMI-APPROACH STUDY.**

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**Background:** MRI bone surface area and femoral bone shape (B-score) measures have been employed as quantitative endpoints in DMOAD clinical trials. The B-score (typical range -2 to +7) has been shown to be an objective, automated assessment of OA status, with clinical risk defined for current and future pain, functional limitation and total knee replacement. Computerized Tomography (CT) imaging is more commonly used for 3D visualization of bony anatomy due to its high bone-soft tissue contrast. Also, CT images are not subject to the geometric distortion in MR images due to field inhomogeneities, a problem addressed in DMOAD clinical trials by positioning the knee near the magnet isocenter. Measurement of 3D joint space width (3DJSW) has been previously reported using CT images but is possible from MR images.

**Objectives:** To test the robustness of the B-score, bone area and 3DJSW imaging endpoints to the choice of imaging modality, we compared the results of automated analysis of CT and MR image pairs acquired at baseline and 24-month timepoints.

**Methods:** We used image data from the IMI-APPROACH exploratory, 2-year prospective cohort study. High resolution CT images were acquired at baseline and 24-months. These were matched with 3D T1w MR images with fat-sat or WE sequences. CT and MR images were acquired within a mean of 12 days of each other. Additional test-retest MR images with repositioning were available from 37 subjects. Kellgren-Lawrence Grades (KLG) were read centrally from screening weight-bearing x-rays. Femur and tibia bones were automatically segmented with sub-voxel accuracy from CT or MR images using active appearance models, a machine learning model trained to search images (Imorphics, Manchester, UK). Bone area measurement was produced for MF.tAB, LF.tAB, MT.tAB and LT.tAB regions. Average 3DJSW was measured in central regions of the medial or lateral tibial plateau, normal to the tibial surface.

Linear regression was used to test for correlation between measures. Limits of agreement and systematic bias were tested using Bland-Altman analysis. Smallest detectable difference (SDD) for MR B-score was computed from test-retest image pairs using Bland-Altman analysis. Images acquired from the same subject at both baseline and 24-month timepoints were treated as independent.

**Results:** Baseline and 24-month CT-MR pairs of the same knee were available from 231 and 203 subjects respectively. 338 were female knees (78%). KLG was KLG0 (19%); KLG1 (31%); KLG2 (30%); KLG3 (16%); KLG4 (3%) with 5 knees from 231 and 203 subjects respectively. 338 were female knees (78%). KLG was KLG0 (19%); KLG1 (31%); KLG2 (30%); KLG3 (16%); KLG4 (3%) with 5 knees from 231 and 203 subjects respectively. 338 were female knees (78%).

**Conclusion:** B-score measures were highly correlated with CT and showed good agreement with a relatively small bias of 0.1 suggesting that B-score may be measured reliably using either modality. All 4 area measures were highly correlated and showed negative bias (MR smaller). It is likely that the bone surface identified using MR and CT will be at slightly different positions within the bone/cartilage boundary. A consistent negative bias suggests the MR bone boundary is inside the CT boundary. This is consistent with the positive bias in favour of MR for 3DJSW. However, the MR-CT difference for medial 3DJSW is larger than for lateral 3DJSW, possibly due to a difference in knee pose during acquisition (fully extended for CT, flexed for MR) – the tibia is more externally rotated with respect to the femur in the fully extended knee.

**Acknowledgements:** IMI-APPROACH investigators and patients

**Disclosure of Interests:** Alan Brett Shareholder of: Stryker Corporation, Employee of: Stryker Corporation, Michael A Bowes Shareholder of: Stryker Corporation, Employee of: Stryker Corporation, Philip G Conaghan Speakers bureau: AbbVie, Amgen, Conturs, Galapagos, Consultant of: AbbVie, Eli Lilly, Galapagos, GSK, Grunenthal, Novartis, Pfizer, UCB

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**Rheumatoid arthritis: JAKi and beyond**

**POSO234**

**HOW CLOSELY DO GERMAN RHEUMATOLOGISTS FOLLOW THE EULAR RECOMMENDATIONS FOR THE MANAGEMENT OF RHEUMATOID ARTHRITIS WHEN MAKING THERAPEUTIC DECISIONS?**

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**Background:** EULAR developed recommendations for the management of rheumatoid arthritis (RA) suggesting treatment escalation and changes at different stages of the disease to reach at least low disease activity with latest updates in 2013, 2016, and 2019. The recommendation to consider adding a biologic disease-modifying anti-rheumatic drug (DMARD) or – since 2016, a Januskinase inhibitor (JAKi) – after the first conventional synthetic (cs) DMARD had failed and if poor prognostic factors (PPF) are present, was strengthened 2019. Since then, it is recommended that a bDMARD or a tsDMARD should be added.

**Disclosure of Interests:** None declared

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**Table 1. Bland-Altman and linear regression statistics.**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Bias [95% CI]</th>
<th>Limits of Agreement</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-score</td>
<td>0.10 [0.05, 0.14]</td>
<td>-0.90, 1.10</td>
<td>0.94</td>
</tr>
<tr>
<td>MF.tAB</td>
<td>-54.983 [-61.22, -48.75]</td>
<td>-184.52, 74.56</td>
<td>0.96</td>
</tr>
<tr>
<td>LF.tAB</td>
<td>-42.792 [-50.72, -34.85]</td>
<td>-130.56, 44.98</td>
<td>0.97</td>
</tr>
<tr>
<td>MT.tAB</td>
<td>5.86 [-9.24, -2.48]</td>
<td>-76.00, 64.38</td>
<td>0.96</td>
</tr>
<tr>
<td>LT.tAB</td>
<td>-21.33 [-23.90, -18.77]</td>
<td>-74.66, 32.00</td>
<td>0.97</td>
</tr>
<tr>
<td>Med 3DJSW</td>
<td>1.04 [0.98, 1.11]</td>
<td>-0.32, 2.40</td>
<td>0.58</td>
</tr>
<tr>
<td>Lat 3DJSW</td>
<td>0.42 [0.34, 0.51]</td>
<td>-1.30, 2.14</td>
<td>0.47</td>
</tr>
</tbody>
</table>

**Figure 1. B-score. Top: Bland-Altman plot; Bottom: linear regression**