$\kappa=0.63$ at follow up); between local and central readers – poor to moderate ($\kappa=0.18$ at baseline and $\kappa=0.58$ at follow up). At follow up, 8 (7.5%) patients progressed from nr-AxSpA to AS, while 6 (5.7%) were reclassified from AS to nr-AxSpA, resulting in net progression of 1.9%. The sacroiliitis sum score increased in 43 (40.6%) patients, decreased in 21 (19.8%) and did not change in 42 (39.6%). Logistic regression analysis showed an association of active and chronic changes on MRI at baseline, already existing structural damage in the sacroiliac joints (sacroiliitis sum score) at baseline and younger age with higher odds for progression from nr-AxSpA to r-AxSpA.

Conclusions: There was a low but still detectable progression from nr-AxSpA to r-AxSpA after up to 5 years of follow-up in the ASAS cohort. Presence of active and chronic changes on MRI, initial structural damage on radiographs, and younger age at baseline were associated with a higher odds for progression from nr-AxSpA to r-AxSpA.

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FRI0176 PERFORMANCE OF SPINAL AND SACROILIAC JOINT MRI FINDINGS IN PATIENTS WITH AXSPA

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Background: Early diagnosis of axial spondyloarthritis (AxSpA) is challenging, particularly in patients with normal sacroiliac joints (SIJs) on radiographs. Currently, magnetic resonance imaging (MRI) is considered as the most sensitive imaging modality for detecting early SpA even before radiographic structural lesions develop. However, there are controversial reports, particularly for the spine, regarding the diagnostic utility of MRI.

Objectives: To determine the diagnostic utility of spine and sacroiliac joint lesions assessed by MRI in patients with ankylosing spondylitis (AS) or non-radiographic AxSpA (nr-AxSpA) compared to chronic mechanical back pain (MBP).

Methods: We included 151 AS, 110 nr-AxSpA, and 37 MBP patients. Spine and SIJ MRIs were performed in all patients. Two independent readers blinded to clinical details of the patients, scored the MRI images. A third reader participated in disputed cases. On T1 weighted sequences, the following structural changes in SIJs were scored: sclerosis (≥ 5 mm) and extensive sclerosis (≥ 10 mm), erosions, ^{1,2} extensive erosions (≥ 3), partial or complete fusion, and fat deposition. Presence in at least two consecutive slices was required for erosions and fusion. On STIR sequences, the following inflammatory changes in the SIJs were determined: ASAS-defined bone marrow oedema (BME) and SPARCC SIJ scores. For the spine, the following were defined: fat infiltration at the vertebral corner on T1 and the number of corner inflammatory lesions (CILs) on STIR. We calculated sensitivity, specificity, and likelihood ratios (LR) of the above-mentioned structural and inflammatory lesions for both AS and nr-AxSpA groups.

Results: There were 298 patients in the study: 151 AS (mean age: 39 (16–77) years; 62.3% male), 110 nr-AxSpA (mean age 36 (17–64) years; 45.5% male), and 37 MBP (mean age 38 (19–59) years; 40.5% male). Presence of erosion was the most sensitive SIJ-MRI finding for structural lesions in AxSpA (AS 97%, nr-AxSpA 89%). However specificity of this variable was low (19%). Evidence of fusion and extensive sclerosis were the most specific SIJ-MRI findings for structural abnormalities with poor sensitivity levels in both groups. On the other hand, presence of extensive erosions showed acceptable sensitivity (78% and 58%) and specificity (62%) values in both AS and nr-AxSpA. For inflammatory lesions of SIJ, both ASAS BME and SPARCC ≥ 2 had similar sensitivity and specificity values in AxSpA. The presence of SIJ fat and evident erosions was associated with a slight increase in Likelihood of AxSpA. Among spinal lesions, spinal fat was the most sensitive finding in AxSpA (67% and 58%) with limited specificity (40%). CILs had moderate to high specificity but low sensitivity. All spinal parameters had low positive LRs.

Abstract FRI0176 – Table 1. Performance of different MRI derived SIJ and spine lesions in AxSpA

	Sensitivity (95% CI)		Specificity (95% CI)		+LR (95% CI)		-LR (95% CI)	
	AS	Nr	AS	Nr	AS	Nr	AS	Nr
Sacroiliac joint								
Sclerosis	51 (41-61)	22 (15-31)	65 (48-80)	65 (48-80)	1.5 (0.9-2.3)	0.6 (0.4-1.1)	0.8 (0.6-1)	1.2 (0.9-1.6)
Evident sclerosis	5 (2-11)	1 (0-5)	100 (91-100)	100 (91-100)			0.95 (0.9-0.99)	0.99 (0.97-1)
Fat	69 (61-77)	36 (27-46)	73 (56-86)	73 (56-86)	2.6 (1.5-4.4)	1.3 (0.7-2.4)	0.4 (0.3-0.6)	0.9 (0.7-1.1)
Erosion	97 (92-99)	89 (82-94)	19 (8-35)	19 (8-35)	1.2 (1-1.4)	1.1 (0.9-1.3)	0.2 (0.1-0.6)	0.6 (0.3-1.4)
Evident erosion	78 (68-85)	58 (48-67)	62 (45-78)	62 (45-78)	2.1 (1.3-3.1)	1.5 (1-2.4)	0.4 (0.2-0.6)	0.7 (0.5-0.9)
Fusion	29 (22-37)	0 (0-3)	100 (91-100)	100 (91-100)			0.7 (0.6-0.8)	25.3 (25.3-25.3)
ASAS BME	51 (43-59)	41 (31-51)	60 (42-75)	60 (42-75)	1.3 (0.8-1.9)	1 (0.6-1.6)	0.8 (0.6-1.1)	0.9 (0.7-1.4)
SPARCC SIJ ≥ 2	51 (43-59)	41 (31-51)	60 (42-75)	60 (42-75)	1.3 (0.8-1.9)	1 (0.6-1.6)	0.8 (0.6-1.1)	0.9 (0.7-1.4)
Spine								
Spinal fat	67 (59-75)	58 (48-68)	40 (24-58)	40 (24-58)	1.1 (0.8-1.5)	0.9 (0.7-1.3)	0.8 (0.5-1.3)	1.1 (0.7-1.7)
CIL presence	45 (37-54)	31 (22-41)	46 (29-63)	46 (29-63)	0.8 (0.6-1.2)	0.6 (0.4-0.9)	1.2 (0.8-1.8)	1.5 (1-2.2)
CIL ≥ 3 vs. <3	27 (20-36)	10 (5-18)	74 (57-88)	74 (57-88)	1.1 (0.6-2)	0.4 (0.2-0.9)	0.9 (0.8-1.2)	1.2 (0.9-1.5)
CIL ≥ 5 vs. <5	19 (13-26)	8 (4-15)	80 (63-92)	80 (63-92)	0.9 (0.4-2)	0.4 (0.2-1)	1 (0.8-1.2)	1.1 (0.9-1.4)

Conclusions: Extensive erosions of SIJ showed the most balanced performance in whole spinal MRI assessment. Spinal lesions performed poorly when compared with SIJ findings in discriminating AxSpA from MBP.

Disclosure of Interest: None declared

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FRI0177 ASSESSING THE VALUE OF WHOLE BODY MAGNETIC RESONANCE IMAGING AS TO CLINICAL EXAMINATION TO PREDICT REMISSION AND RELAPSE IN EARLY PERIPHERAL SPONDYLOARTHRITIS

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Background: Evaluation of disease activity and treatment response in peripheral spondyloarthritis (pSpA) is currently based upon clinical findings, laboratory tests and ultrasound examination. Whole-body magnetic resonance imaging (WB MRI) is a relatively new imaging technique that could offer additional information regarding the inflammatory status of joints, entheses and soft tissues.

Objectives: To determine A) the value of WB MRI, performed at baseline, in relation to clinical remission in pSpA and B) the value of subclinical inflammation, detected by WB MRI, at time of clinical remission in predicting flare after treatment withdrawal in pSpA.

Methods: Clinical REmission in peripheral SPondyloArthritis (CRESPA) is a placebo-controlled trial of golimumab treatment in 60 early (symptom duration <12 weeks) pSpA patients (pts). All pts underwent a modified WB MRI at baseline and at the time of clinical remission when treatment was withdrawn. The WB MRI was performed by scanning multiple locations individually (using different coils) in order to investigate SpA-specific locations in detail. Several anatomical sites of pelvis and lower limbs were evaluated for bone marrow oedema (BME), synovitis and soft tissue inflammation (STI) by 3 readers, giving a score of 0 (no abnormalities), 1 (mild), 2 (moderate) or 3 (severe). For each site a mean of the scores of the 3 readers was calculated. For each patient at each time point, we calculated a sum score for synovitis, STI and BME separately adjacent to a total sum score. Changes scores are baseline minus remission sum scores.

Results: Pts reaching clinical remission had significant lower baseline BME sum scores than the non-remission group (mean 1.86 vs. 2.89, $p=0.024$). At the time of clinical remission 10/45 (22%) and 11/45 (24%) pts had residual talocrural and subtalar synovitis respectively. However, there was no statistically significant difference between patients who relapsed after treatment withdrawal and those who remained in remission concerning synovitis sum scores ($p=0.497$) as well as BME sum scores ($p=0.741$) and STI sum scores ($p=0.131$) at time of clinical remission (table 1).

Abstract FRI0177 – Table 1. BME, synovitis and STI presence in early pSpA pts who relapsed and did not relapse after stopping golimumab therapy

	Patients relapsed (n=20)	Patients not relapsed (n=25)
BME at baseline	1.82 (± 2.29)	1.69 (± 1.62)
BME at follow-up	1.32 (± 1.12)	1.09 (± 1.18)
Change score BME	0.50 (± 1.36)	0.52 (± 1.42)
Synovitis at baseline	2.53 (± 3.11)	3.53 (± 3.04)
Synovitis at follow-up	1.13 (± 1.41)	1.44 (± 1.49)
Change score synovitis	1.50 (± 2.71)	2.16 (± 2.81)
STI at baseline	1.67 (± 1.81)	2.07 (± 2.38)
STI at follow-up	0.93 (± 0.75)	1.01 (± 1.12)
Change score STI	0.70 (± 1.34)	1.00 (± 2.06)

Conclusions: Early pSpA pts who reach clinical remission have less BME on baseline WB MRI compared to those with ongoing disease activity. At time of clinical remission, a substantial part of the participants showed residual ankle synovitis on MRI. However, residual inflammatory lesions detected by WB MRI did not differ significantly between pts who relapsed after treatment withdrawal and those in ongoing clinical remission.

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FRI0179 INTEGRATED LONGITUDINAL ANALYSIS INCREASES PRECISION AND REDUCES BIAS: A COMPARATIVE 5-YEAR ANALYSIS IN THE DESIR COHORT

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Background: Evaluation of imaging is important in spondyloarthritis (SpA) research, but loss to follow up often jeopardises interpretation of the evaluation. The Interpretation may further be challenged by the fact that often different readers have contributed to scores, in multiple read 'waves'. A common approach is to evaluate patients (pts) with complete follow up (completers analysis), and aggregate scores of individual readers (eg. agreement ≥ 2 out of 3 readers). These approaches are not assumption-free, may cause non-random data loss, and may as such provide spurious estimates and loss of external validity.

Objectives: We aimed to investigate if the use of all data in an assumption-free manner (a so called 'integrated analysis') affects the precision of estimates for imaging outcomes in pts with axial SpA (axSpA), with completers analysis as reference standard.

Methods: Pts from the DESIR cohort fulfilling the ASAS axSpA criteria were included. Radiographs and MRIs of the SIJ and spine were obtained at baseline (BL), 1, 2 and 5 years. Each film was scored by 2 or 3 readers in 3 'reading-waves' (wave 1: BL only; wave 2: BL, 1, 2 years; wave 3: BL, 2, 5 years). Each outcome was analysed in two ways: i. according to a 'combination algorithm' ('2 out of 3' for binary and mean of 3 readers for continuous variables); and ii. per individual reader. The change of each outcome was analysed by generalised estimating equations (GEE) with 'time' as explanatory variable. Three analytical approaches were pursued: i) 'integrated-analysis' (including all pts with ≥ 1 score from ≥ 1 reader from all waves); ii) completers-only analysis (including only pts with complete 5 year follow-up, using scores from individual readers from wave 3); iii) aggregated completers analysis using a combination algorithm (the same as ii but using combined scores).

Results: In total, 413 pts were included (mean (SD) symptom duration: 1.6 (0.9) years) and 366 completed the 5 year follow up. An analysis with all data from different readers and 'waves' ('integrated analysis') was more inclusive, but did not result in a meaningful loss of precision (width of 95% CIs) of the change-estimates as compared to both completers analyses (table 1). In fact, for low-incidence outcomes (e.g. % of mNY-positive over 5 years), a similar incidence was 'captured', with more precision, by the 'integrated analysis' compared to the completers

analysis with combined scores (% change/year (95% CI): 1.1 (0.7; 1.5) vs 1.2 (0.5; 1.8), respectively). The same results were seen using continuous outcomes.

Abstract FRI0179 – Table 1. Change per year in the percentage of positive cases for binary imaging outcomes over 5-years of follow-up, according to 3 different analytical methods, in early axSpA patients fulfilling the ASAS axSpA criteria from the DESIR-cohort

	Integrated analysis	Completers analysis with individual readers scores	Completers analysis with combined scores for readers
Imaging outcomes	% change per year (95% CI) (N=399-411)	% change per year (95% CI) (N=342-364)	% change per year (95% CI) (N=338-364)
SACROILIAC JOINTS			
Sacroiliitis on MRI-SIJ (ASAS criteria)	-7.4 (-11.7; -3.1)	-5.4 (-8.9; -1.9)	-3.1 (-5.1; -1.2)
≥ 3 fatty lesions on MRI-SIJ	4.7 (2.7; 6.7)	3.3 (1.7; 4.9)	2.1 (1.1; 3.0)
mNY on X-SIJ (positive/negative)	1.1 (0.7; 1.5)	0.9 (0.5; 1.3)	1.2 (0.5; 1.8)
SPINE			
BME: ≥ 3 lesions on MRI-Spine (ASAS criteria)	-0.8 (-2.3; 0.7)	-0.4 (-1.4; 0.5)	-0.1 (-1.2; 1.0)
≥ 5 fatty lesions on MRI-Spine	-0.2 (-0.9; 0.4)	-0.1 (-0.5; 0.2)	-
≥ 1 syndesmophyte on X-Spine	0.8 (0.5; 1.2)	0.5 (0.2; 0.8)	0.5 (0.1; 0.9)

Conclusions: An efficient and entirely assumption-free usage of all data from different readers and 'read-waves' does not compromise precision of the estimates of change in imaging parameters, and may yield increased statistical power for detecting changes with low incidence. In addition, integrated analysis may protect against attrition bias and avoid bias by 'convenient choices'.

Disclosure of Interest: None declared

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FRI0180 DIAGNOSIS JOURNEY OF PATIENTS WITH ANKYLOSING SPONDYLITIS IN THE UNITED STATES

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Background: A US-based study demonstrated that patients with ankylosing spondylitis (AS) experience a significant delay (on average 14 years) from symptom onset to diagnosis of AS.¹ Understanding the diagnosis journey of patients with AS and identifying opportunities to reduce misdiagnosis and incorrect referral are crucial to reducing time to diagnosis, preventing irreversible joint damage, and preserving mobility.

Objectives: To describe the patient journey to AS diagnosis from the patient perspective and differences observed between females and males.

Methods: US adults aged ≥ 18 years with a self-reported diagnosis of AS were recruited through CreakyJoints, an online patient support community comprising patients with arthritis and arthritis-related diseases and their caregivers. Respondents completed a web-based survey on socio-demographics, clinical symptoms, disease burden, and diagnosis history, which included symptoms that led to seeking care, time from symptom onset to seeking care and from seeking care to AS diagnosis, types of healthcare providers seen, and misdiagnoses. Survey questions were developed following analysis of qualitative interviews of patients with AS and clinical experts, as well as a targeted literature review. Survey results were compared between females and males using 2-sample t tests for continuous variables and chi squared tests for categorical variables.

Results: Among 235 respondents, 174 (74%) were female. Mean (SD) age of female and male respondents were 48.6 (10.6) and 53.1 (10.3) years, respectively. Although the majority (58% female and 54% male) sought medical care within the first year of symptom onset, female respondents reported a mean of 17.2 years since first symptom onset and 7.5 years since AS diagnosis; while male respondents reported a mean of 20.0 years since first symptom onset and 11.4 years since AS diagnosis. The most common symptoms that led to seeking medical care were back pain, joint pain, stiffness, and fatigue (figure 1A). During the diagnosis process, patients reported seeking medical care from a general practitioner (87%), rheumatologist (65%), orthopedist (27%), chiropractor (26%), and urgent care/emergency room doctor (21%) with no differences between females and males. The most commonly reported misdiagnoses were back problems (56%), psychosomatic (23%), and sciatica (21%) in males, while psychosomatic (41%), back problems (40%), and anxiety/depression (24%) were most common in females. Significantly higher proportions of females reported misdiagnoses of fibromyalgia (21% vs 7%) and psychosomatic (41% vs 23%) (figure 1B).