Results: Pelvic radiographs of 340 patients (110 with axSpA including 61 patient with radiographic and 49 with non-radiographic axSpA, and 230 without SpA) were available for the CNN evaluation. The deep CNN achieved a sensitivity of 79% for the diagnosis of radiographic axSpA. The specificity of radiographic sacroiliitis detection was 94% (Table 1). The area under the receiver operating characteristics curve for the prediction of the presence of definite radiographic sacroiliitis was 88%. Figure 1 shows an exemplary class activation map of our CNN.

Table 1. Convolutional neural network predictions of the presence of radiographic sacroiliitis in patients with suspected axSpA according to the final diagnosis by rheumatologist in OptiRef (N=340).

Clinical diagnosis	CNN's prediction on the presence of definite radiographic sacroiliitis	
	Present	Not present
Radiographic axial SpA	48/61 (78.7%)	13/61 (21.3%)
Non-radiographic axial SpA	4/49 (8.2%)	45/49 (91.8%)
No SpA (other diagnosis)	14/230 (6.1%)	216/230 (93.9%)

Conclusion: The artificial neural network showed good generalizability and a high specificity with acceptable sensitivity in the detection of radiographic sacroiliitis when applied in the diagnostic setting of patients with chronic back pain and suspicion of axSpA. This algorithm can therefore be used to aid the detection of radiographic sacroiliitis as a part of the diagnostic approach.

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Figure 1. Inference of the proposed CNN on a randomly chosen pelvic radiograph from the OptiRef study.

This exemplary class activation map shows that our CNN almost exclusively and correctly focusses on the sacroiliac joints to predict whether definite radiographic sacroiliitis is present or not.

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OP0255 THE ROLE OF PELVIC MORPHOLOGY IN AXIAL SPONDYLOARTHRITIS

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Background: Axial Spondyloarthritis (axSpA) is a chronic inflammatory disease affecting the axial skeleton. It includes non-radiographic axSpA and radiographic axSpA [Ankylosing Spondylitis (AS)]. Male axSpA patients often have greater damage, while women report a higher disease burden. The role of pelvic morphology in the axSpA phenotype has not been explored. There is anatomic sexual dimorphism between the male and female pelvis. Given the phenotypic gender differences in axSpA, the role of pelvic morphometry is of interest.

Objectives: The purpose of this study is to determine whether an association exists between pelvic dimensions and radiographic damage in patients with axSpA, as well as to compare these measurements in axSpA patients and healthy controls.

Methods: This was a cross-sectional analysis comparing axSpA cases from a prospective cohort and non-axSpA controls from the UCSF radiology database. Informed consent was obtained from axSpA cohort patients and this study was approved by the institutional IRB. To be included in the analysis, we limited inclusion to age ≤ 50 with an Anterior Posterior (AP) pelvis radiograph in the system. We excluded non-nulliparity, pelvic fracture history, BMI ≥ 30 kg/m², any prosthetic history and avascular necrosis. We measured the pelvic inlet, pelvic outlet, and subpubic angle (based on validated scoring methods) (Figure 1) and assessed its relation to sacroiliac joint (SIJ) damage (average SIJ score, New York criteria) and modified Stoke Ankylosing Spondylitis Spine Score (mSASSS) in cases. AxSpA patients were also compared to age/gender matched controls. Pelvic measurements were performed by 2 blinded independent-trained readers in randomized, blinded image order. Inter-rater reliability was assessed. When examining the relationship between pelvic measurements and damage, linear regression was used to stratify by gender and adjust for potential confounders.

Results: The axSpA cohort included 481 patients, of which 210 men and 89 women were included in this analysis and gender/age matched controls. Rater inter-class correlation was above 0.70 for pelvic outlet and above 0.80 for other measures. Cases and controls were similar (Table 1). The regression analysis showed a significant relationship between the sub-pubic angle and damage in the spine (coeff=-0.342, p=0.003) in men with axSpA. A sensitivity analysis, excluding mSASSS outliers (mSASSS ≥ 16) upheld the relationship (coeff=-1.40, p=0.002).

Conclusion: In men with axSpA, there appears to be a relationship between sub-pubic angle and spinal radiographic damage. This is consistent with our finding that women have larger sub-pubic angles and lower spinal radiographic damage than men. A greater sub-pubic angle may protect against spinal involvement or associate with other protective factors. Further work should be performed to understand the contribution of pelvic anatomy to damage in axSpA.

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OP0256 CHOOSE WISELY: IMAGING FOR DIAGNOSIS OF AXIAL SPONDYLOARTHRITIS

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Background: To date, the European Alliance of Associations for Rheumatology (EULAR) guidelines recommend X-ray (XR) as first line imaging in axial Spondyloarthritis (axSpA) and magnetic resonance imaging (MR) if the diagnosis cannot be established by XR and clinical features. However, much knowledge has been gained recently strengthening the applicability of MR for the detection of structural lesions and raising the question, whether XR is still necessary. Also, several publications used low-dose computed tomography (CT) as reference standard and imaging test.

Objectives: In light of this complex diagnostic situation, the aim of this study was to compare the three major modalities, XR, MR and CT of SIJ, in their diagnostic performance of axSpA and differential diagnosis in a cohort of patients with low back pain using the final judgment of the rheumatologist as standard of reference.

Methods: 163 patients (89 with axSpA; 74 with degenerative diseases) underwent XR, CT and MR. Three blinded experts categorized the imaging into axSpA, other diseases or normal in 5 separate reading rounds (XR, CT, MR, XR+MR, CT+MR, respectively). The results were compared to the clinical diagnosis. Sensitivity and specificity values for axSpA and interrater reliability were compared.

Results: XR showed lower sensitivity and specificity (66.3%/67.6% respectively) compared to MR (82.0%/86.5%) and CT (77.5%/97.3%). Sensitivity and specificity of XR+MR was similar to MR alone (77.5% / 87.8%). However, CT+MR was

superior to MR alone (75.6% / 97.3%) (see Figure). CT had the best interrater reliability ($\kappa = 0.875$) followed by MR (0.665) and XR (0.517). CR+MR reliability was similar (0.662) compared to MR alone, while CT+MR reliability (0.732) was superior.

Figure 1. Frequency of positive and negative findings in radiography (XR), computed tomography (CT), magnetic resonance imaging (MR) and combinations and resulting diagnostic accuracy values. SE: Sensitivity, SP: Specificity, LR+/-: negative/positive likelihood ratio.

Conclusion: In conclusion, XR is inferior to cross-sectional imaging and should be replaced by MR or CT for differential diagnosis. While MR is the most sensitive imaging technique, it lacks specificity when compared to CT. CT alone has high diagnostic accuracy, despite being insensitive to bone marrow lesions such as fatty metaplasia or osteitis. Adding CT to MR leads to an increase in specificity at a minor expense of sensitivity.

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OP0257

VALUE OF COLOR DOPPLER ULTRASOUND ASSESSMENT OF SACROILIAC JOINTS IN NON-RADIOGRAPHIC AXIAL SPONDYLOARTHRITIS: A COMPARISON WITH ANKYLOSING SPONDYLITIS

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Background: Ultrasound (US) is an accessible imaging technique with a possible role to diagnose active sacroiliitis, so this technique is projected as a promising diagnostic tool for the diagnosis of spondyloarthritis (SpA). The diagnostic value of sacroiliac US has been studied in patients with Ankylosing Spondylitis (AS), becoming a useful and practical tool in comparison with MRI. There are scarce data on the utility of US in the evaluation of Non-radiographic Axial Spondyloarthritis (nr-axSpA).

Objectives: The aim of this study is to evaluate the diagnostic utility of color Doppler ultrasound (CDUS) for the detection of sacroiliitis in patients with nr-axSpA and AS.

Methods: Patients with nr-axSpA (n=114) and AS (n=80) were enrolled in the study with standardized clinical criteria. According to the Bath Ankylosing

Spondylitis Disease Activity Index (BASDAI), nr-axSpA and AS patients were separately divided into active group (n=47, n=43) and inactive group (n=67, n=37). All patients underwent clinical evaluation, and CDUS of sacroiliac joints (SIJs) within the same week. Vascularization, the resistive index (RI) of the SIJs and the first foraminal ramus of the lateral sacral artery were observed and measured by a sonographer who is blinded to initial clinical and radiological assessments. The associated statistics and graphs were utilized to obtain the relationship, which were reflected by the Co-index receiver operating characteristic (ROC) curve or calculating the area under ROC curve (AUC), between the RI of the SIJs and the RI of the first foraminal ramus of the lateral sacral artery in nr-axSpA and AS by using the Logistic Regression analysis methods, SPSS24.0 and MedCalc19.6.0 software. With MRI-proven sacroiliitis as the diagnostic standard, the Kappa test was used to measure the consistency between the RI of the SIJs and MRI.

Results: 1. The RI of the SIJs (AUC=0.855, P<0.001) and Co-index (AUC=0.886, P<0.001) were similar sufficient (Z=1.331, P=0.183) to distinguish the active and inactive group in nr-axSpA. 2. The RI of the SIJs (AUC=0.869, P<0.001) and Co-index (AUC=0.893, P<0.001) were also similar sufficient (Z=1.292, P=0.196) to distinguish the active and inactive group in AS. 3. Neither of the RI of the first foraminal ramus of the lateral sacral artery in nr-axSpA (AUC=0.748, P<0.001) and AS (AUC=0.674, P=0.003) was outstanding to distinguish the active and inactive group. 4. The RI of the SIJs was similar sufficient (Z=0.267, P=0.790) to detect sacroiliitis in nr-axSpA and AS. 5. The Co-index was also similar sufficient (Z=0.146, P=0.884) to detect sacroiliitis in nr-axSpA and AS. 6. The RI of the SIJs in nr-axSpA and AS showed moderate consistency with MRI (the Kappa values were 0.534 and 0.609, respectively, P<0.01).

Conclusion: The RI of the SIJs is a possible role to diagnose active sacroiliitis, so CDUS is projected as a promising diagnostic tool for the diagnosis of nr-axSpA and AS in comparison with MRI.

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HPR Abstract Session (II)

OP0258-HPR

IS THERE A SUBSET OF PATIENTS WITH SJÖGREN'S SYNDROME WHO ARE MORE AT RISK FOR SEXUAL DYSFUNCTION? RESULTS FROM A SCOPING REVIEW

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Background: Individuals with Sjögren's syndrome (SS) experience significantly higher levels of sexual dysfunction and sexual distress than healthy controls (van Nimwegen et al., 2015). Identifying associated factors may help to identify a subgroup of patients with SS who may benefit from early intervention to maintain sexual wellbeing and avoid unnecessary sexual disruption.

Objectives: To explore and map the salient symptoms and factors that influence alterations in sexual functioning and intimate relationships for people with SS.

Methods: The protocol for this review was registered with the Open Science Framework prior to commencement of the searches. The peer-reviewed search strings were used to search the following databases from inception to June 2019: Cochrane Library, CINAHL [EBSCO], MEDLINE [ProQuest], PUBMED [MEDLINE], ScienceDirect, Scopus and Web of Science. Grey literature was searched for on academic databases, topic-specific repositories, and Google Scholar. Databases were searched using key terms corresponding to sexual functioning and intimate relationships. Studies were included if their participant sample was comprised of adults aged ≥18 years, with a diagnosis of primary or secondary SS. Studies were not excluded based on source type, methodology or design. To qualify for inclusion, studies needed to have been peer-reviewed and available in English. Retrieved articles were then screened against the inclusion/exclusion criteria by two reviewers. Hand-searching was conducted on the reference lists of included articles, as well as the three most prevalent publishing journals until saturation had been achieved.

Results: The search strategy returned 3527 unique citations. After screening processes were completed, only 19 articles met the inclusion criteria. Studies were predominately conducted in European countries (79%), within the last decade (68%; 2010-2019), and were mainly quantitative (n = 17; 89.5%), case-controlled