

THE SPONDYLOARTHRITIS RESEARCH CONSORTIUM OF CANADA: MAGNETIC RESONANCE IMAGING INDEX FOR SCORING INFLAMMATION IN THE SACROILIAC JOINTS

University of Alberta

Walter P. Maksymowych

Robert G.W. Lambert

Suhkvinder S. Dhillon

University of Toronto

Robert D. Inman

David Salonen

Millicent Stone

Our scoring method for active inflammatory lesions in both spine and sacroiliac (SI) joints relies on the use of a T2-weighted sequence that incorporates suppression of normal marrow fat signal. We have opted for the STIR sequence which offers greater reliability when using large fields of view compared to T2 spin echo with spectral pre-saturation. All scores are based on abnormal increased signal on the STIR sequence representing increased concentration of “free water” otherwise referred to as “bone marrow edema”. The scoring method described below assumes that images have been acquired according to our MRI acquisition protocol as described on our website ([MRI of the sacroiliac joints-SPARCC MRI methodology](#)).

SCORING METHODOLOGY - TEN STEPS

1. All scores are dichotomous – present or absent, 1 or 0.
2. Only 6 coronal slices are assessed. Slices 4-9 are usually selected as those representing the largest proportion of the synovial compartment of the SI joints. Images scored at a second time point are selected to correspond as closely as possible to the first time point – normally 4-9, 3-8 or 5-10.
3. Only abnormalities on the STIR sequence are scored. T1 SE images are included for anatomical reference.
4. Score all lesions within the iliac bone. Within the sacrum, score lesions medially as far as the lateral border of the sacral foramina.
5. Sacral inter-foraminal bone marrow signal is used as the reference for normal to determine a threshold for increased signal in periarticular bone.
6. Each SI joint is divided into four quadrants: 1 upper iliac, 2 lower iliac, 3 upper sacrum, 4 lower sacrum. The presence of increased signal in each quadrant is recorded. Maximum score for two SI joints in each coronal slice is 8. Maximum score for 6 coronal slices = 48.
7. A score for “intense” may be assigned to each SI joint on each slice. High signal from slow flowing venous blood within presacral veins acts as a reference for assigning an “intense” reading score to a bone lesion. A score of 1 is assigned if “intense” signal is seen in any quadrant of an SI joint on a single slice. Maximum score per slice is therefore 2, and for 6 slices = 12.
8. A score for “deep” may be assigned to each SI joint on each slice. A lesion is graded as “deep” if there is homogeneous and unequivocal increase in signal extending over a depth of at least 1 cm from the articular surface. A score of 1 is assigned if “deep” signal is seen in any quadrant of an SI joint on a single slice. Maximum score per slice is therefore 2, and for 6 slices = 12.
9. Pre- and post-treatment MR images are scored together with observer blinded to time sequence.
10. Non-Spondyloarthritis control images and reference Spondyloarthritis cases are available at this website to attain familiarity with the scoring method.

Total maximum score is 72:

Presence of “bone marrow edema”	= 48
Presence of “intense edema”	= 12
Presence of “deep edema”	= 12
	<u>72</u>