

**Introduction:** Radiographic joint space narrowing is the most reliable indicator of the progression of cartilage loss due to Osteoarthritis (OA). To obtain reliable information concerning joint space narrowing, two requirements must be met: a standardized protocol which produces good quality radiographs of the joint and accurate delineation of the joint boundaries. We present an algorithm which meets the second of these objectives for the hip joint.

**Methods:** Processing software has been developed which defines the boundaries of the hip joint space from digitized x-rays. The joint space is defined by two edges: the acetabulum and femur head. The two edges are found automatically and the minimum joint space width (MJSW) is calculated as the index of joint narrowing. 10 OA cases were analyzed on 5 occasions to establish the intra-observer reproducibility of MJSW and compared to MJSW read by two radiologists utilizing a graduated magnifying glass.

**Results:** The mean %CV for MJSW was less than 3% and significantly better than the variability among radiologists (inter-observer variability CV ~ 4 to 10%). Compared to the manual method the automated technique reduced radiologist involvement to less than 1 minute per case.

**Conclusion:** Automated segmentation of radiographic hip joint space narrowing is less subjective than the currently utilized manual film tracing method, significantly reduces the amount of radiologist involvement, and may be applicable for routine clinical use.