CASE STUDY · MUSCULOSKELETAL

Rheumatoid Arthritis Modified Sharp Scoring

60 sites · Hand and foot radiographs · mTSS erosion and JSN

Challenge

Intrinsic Imaging supported this study's imaging activities, addressing the scientific and operational considerations that inform the work of an imaging CRO and imaging core lab. Structural progression in rheumatoid arthritis is measured in small increments of erosion and joint space narrowing, and detecting change over 52 weeks demands a scoring methodology of exceptional repeatability. Modified total Sharp scoring is labor-intensive and interpretive, and without rigorous central control, reader drift and inter-reader variability can readily exceed the magnitude of the treatment effect the trial seeks to demonstrate. The sponsor needed central assessment disciplined enough to report the smallest detectable change with confidence.

Radiographic acquisition had to be equally consistent. Hand and foot positioning, exposure and image resolution all affect the visibility of erosions and joint margins, and variability in acquisition could obscure subtle structural change or create apparent change where none had occurred. With 60 sites participating, the sponsor required standardized acquisition, reproducible mTSS scoring and sustained reader calibration throughout follow-up. Because small differences in progression could be interpreted meaningfully only in relation to the repeatability of the scoring process, individual scores, paired comparisons and adjudications needed to remain attributable to their readers and source examinations across the complete longitudinal follow-up.

Intrinsic Imaging's Solution

Intrinsic Imaging provided sites with standardized radiographic positioning and acquisition guidance, supported by training and quality feedback. Each submission was checked for completeness and image quality, and sites were contacted promptly when repeat imaging was required, so that acquisition variability was controlled before it could reach the readers.

Two blinded musculoskeletal radiologists independently scored paired hand and foot radiographs, with timepoint order randomized to prevent chronological bias from influencing scoring. Readers were trained and calibrated against reference cases before scoring began, and a detailed scoring charter governed every assessment. Paired timepoints were reviewed together under blinded, randomized conditions, and reader performance was monitored throughout the study to confirm that scoring precision remained stable across the full 52-week follow-up.

Adjudication thresholds were defined in the charter before reading began, ensuring that large discordances between readers were handled consistently. Adjudicators reviewed the complete radiographic series under the same blinded conditions, and their decisions were documented, providing a transparent account of every resolved disagreement. The approach addressed the central methodological problem of structural progression studies, in which small longitudinal changes are difficult to distinguish from variability introduced by inconsistent acquisition or reader drift; controlling both sources allowed treatment effect to be evaluated with greater confidence and established a methodology the sponsor could apply across its broader rheumatoid arthritis program.

Intrinsic Imaging’s Results

- Smallest detectable change reported per protocol, with modified total Sharp scoring repeatable enough to resolve erosion and joint space narrowing over 52 weeks
- 60 sites brought to a common hand and foot radiographic positioning standard, reducing acquisition artifact that could otherwise mimic or mask true structural progression
- Consistent scoring across readers, confirmed by continuous performance monitoring, blinded randomized timepoint order and adjudication thresholds defined in the charter before reading
- Central imaging data supported the structural endpoint, with every score, paired comparison and adjudication attributable to its reader and source examinations

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Read the full study online: https://intrinsicimaging.com/case-studies/musculoskeletal-ra

About Intrinsic Imaging, LLC

Intrinsic Imaging is an ISO certified medical imaging CRO and imaging core lab providing comprehensive services in support of Phase I-IV clinical trials and Class I, II, III medical device trials. Intrinsic Imaging is also a world leader in conducting Artificial Intelligence studies. With its team of more than 650 board-certified and fellowship-trained physicians, Intrinsic Imaging’s team has sub-specialization in all therapeutic areas, including Cardiovascular, Central Nervous System,Gastroenterology, Musculoskeletal, Oncology and Ophthalmology. Certified by the British Standards Institution (BSI), Intrinsic Imaging is the only company in the world to hold five ISO certifications specifically for providing imaging core lab services on clinical trials. For more information, please visit www.IntrinsicImaging.com.

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