CASE STUDY · CARDIOVASCULAR & THORACIC

# Idiopathic Pulmonary Fibrosis Trial With Quantitative HRCT

45 sites · Thin-section non-contrast HRCT · UIP pattern confirmation and quantitative fibrosis score

## 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. Forced vital capacity remains the accepted primary endpoint in idiopathic pulmonary fibrosis, but it is noisy, effort-dependent and slow to register treatment effect. The sponsor of this Phase IIb/III program required imaging to serve two purposes: confirm at screening that each participant's high-resolution CT showed a usual interstitial pneumonia pattern consistent with the diagnosis, and quantify the extent of fibrotic lung over 52 weeks as a key secondary endpoint capable of supporting the FVC result.

Quantitative CT is acutely sensitive to acquisition. Reconstruction kernel, slice thickness, inspiration level and contrast all alter the texture features and density thresholds on which fibrosis quantification depends. Across 45 sites with scanners from four vendors, uncontrolled acquisition would have introduced variability large enough to overwhelm a treatment effect. The screening read also demanded thoracic radiology expertise: distinguishing definite and probable UIP from alternative patterns is a specialist judgment, and screen failures on imaging grounds have direct consequences for enrollment. Because quantitative CT measures were still regarded as exploratory by some reviewers, the sponsor also needed the method documented rigorously enough to stand beside the spirometry in the clinical study report.

## Intrinsic Imaging’s Solution

Intrinsic Imaging issued an HRCT acquisition protocol that fixed slice thickness, reconstruction kernel, breath-hold instructions and the requirement for non-contrast, supine, full-inspiration imaging, with a prone series where the protocol required it. Each site was qualified with a test acquisition reviewed against the protocol before its first participant was scanned, and quality control on every incoming examination checked inspiration level and kernel so that a non-conforming scan could be repeated within the screening window.

Screening HRCTs were read by thoracic radiologists applying the current international diagnostic criteria for UIP, with a second reader for any case classified as indeterminate and adjudication where the two disagreed. Longitudinal quantification of fibrotic lung extent was performed centrally with validated quantitative software, with lung segmentation checked and corrected by trained analysts and the baseline and follow-up scans processed as a registered pair. Visual fibrosis scores by the radiologists were captured alongside the quantitative measures so the sponsor could present both to regulators.

The method was documented thoroughly: the software version was fixed for the duration of the study, test-retest variability was established on a set of same-day repeat scans before enrollment, and a phantom-based check of density calibration was performed on every qualified scanner at activation and annually thereafter. These records allowed the sponsor to describe the imaging endpoint in the clinical study report with the same rigor as the spirometry.

## Intrinsic Imaging's Results

- 11% of screened participants excluded on central UIP review by thoracic radiologists, protecting the trial population from diagnostic heterogeneity at enrollment
- 98% of HRCT examinations met the acquisition protocol and were analyzable quantitatively; the remainder were repeated within the visit window rather than lost
- 45 sites and four scanner vendors held to a fixed kernel, slice thickness and inspiration standard, with density calibration verified at activation and annually
- 52-week quantitative fibrosis change delivered as a complete dataset aligned to the FVC analysis, with reproducibility documented for the clinical study report

Read the full study online: https://intrinsicimaging.com/case-studies/respiratory-ipf

## 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 50 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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