RESEARCH REPORT

Pharma Ignite

# Understanding The Impact Of Reader Variability In Imaging For Oncology Clinical Trials: An Industry Perspective

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# Understanding The Impact Of Reader Variability In Imaging For Oncology Clinical Trials: An Industry Perspective

Oncology drug development continues to be a major area of focus in the life sciences industry. The five largest global pharmaceutical companies invested 14-30% of their annual revenue into R&D in 2023—all prioritizing assets in oncology.[1] This upward trend in investment necessitates more accurate and efficacious radiological image reading in oncology clinical trials.

As more novel therapies are discovered, there are more standards required in clinical trial imaging to ensure the safety and efficacy of cancer drugs, resulting in greater reliance on blinded independent central review (BICR) to manage image read variability—and potentially, greater discrepancies among image reads due to the increasing complexity and high volume of radiological images that need to be reviewed.

Citeline and Median Technologies recently conducted a survey to better understand the industry's perspective on image read variability and the future outlook of image reading in oncology clinical trials. The following report summarizes the survey's key findings, examining the image read preferences and experiences of life sciences industry professionals in the current oncology clinical trial setting.

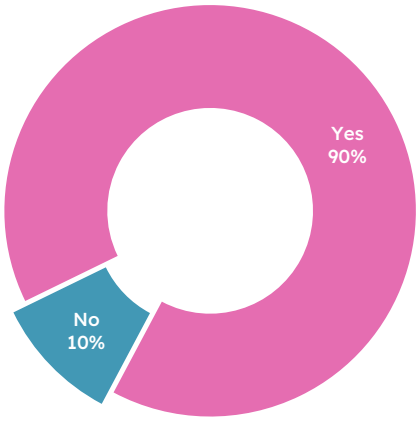
## How Image Read Variability Plays A Role In Oncology Clinical Trials

As clinical trials continue to evolve with the addition of advanced imaging technologies and new treatment modalities to the landscape, image reading is becoming more complex. Life sciences organizations are having to keep pace with new imaging criteria and other changes, amidst talent shortages and budget constraints.

Reader variability in clinical trial imaging has long been an important topic within the industry, both between site and central assessments, and within central assessment as well. This is due to intricacy associated with the quality of evaluation, which aims to unmask potential biases or errors in the absence of tangible ground truth, such as overall survival. It therefore has a direct impact on the reading paradigm and drug development costs.

While reader variability poses challenges for biopharmaceutical sponsors, it is crucial to recognize that a healthy amount of variability is vital to understanding the efficacy of new therapies. There has been plenty of discourse around how imaging reading

## Figure 1. Image Read Variability



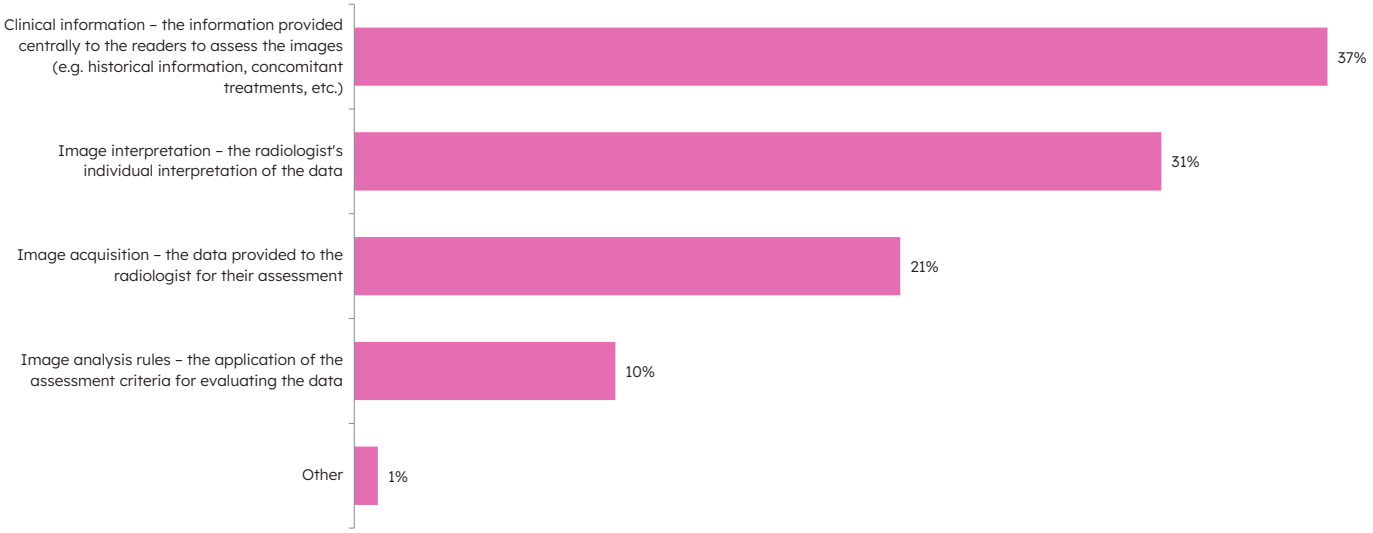

**Question: Is image read variability the most challenging aspect of oncology clinical trial imaging at your company?**
Base: All respondents (n=105).

is managed; however, until now, there has been little research conducted on the perception of image read variability from individuals experiencing it day-to-day. This survey sets out to do just that.

The first question the survey asked is whether or not image read variability is the most challenging aspect of oncology clinical trials. Respondents from the industry overwhelmingly confirmed that it is, with 90% saying 'Yes' (Figure 1). Going further, the survey found that the clinical information provided centrally to readers to assess images causes the most variability within oncology clinical trials (Figure 2).

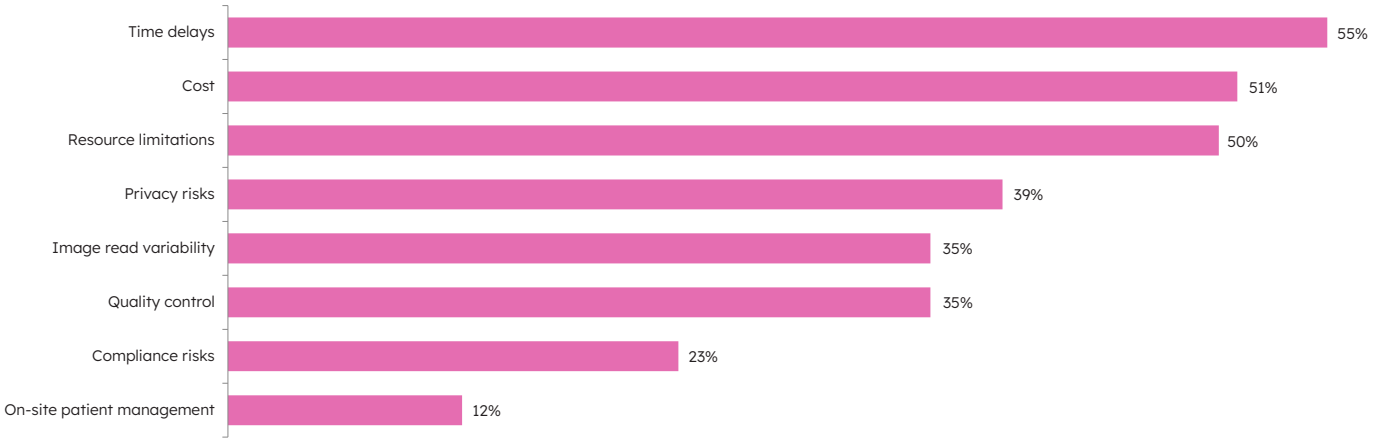
The challenge of gathering the correct clinical information is a significant one. Median has one of the most sophisticated reader frameworks, where they strategically develop the set of contextual clinical information that will be provided to the readers in advance to ensure accuracy. This includes benchmarked data – a baseline analysis which has been proven to improve discrepancy rates.[2]

## Figure 2. Image Read Variability In Oncology Clinical Trials




**Question: Which of the following steps in the image-read process produces the most variability in your oncology clinical trials?**
Base: All respondents (n=110).

## Figure 3. Central Reads Usage Challenges



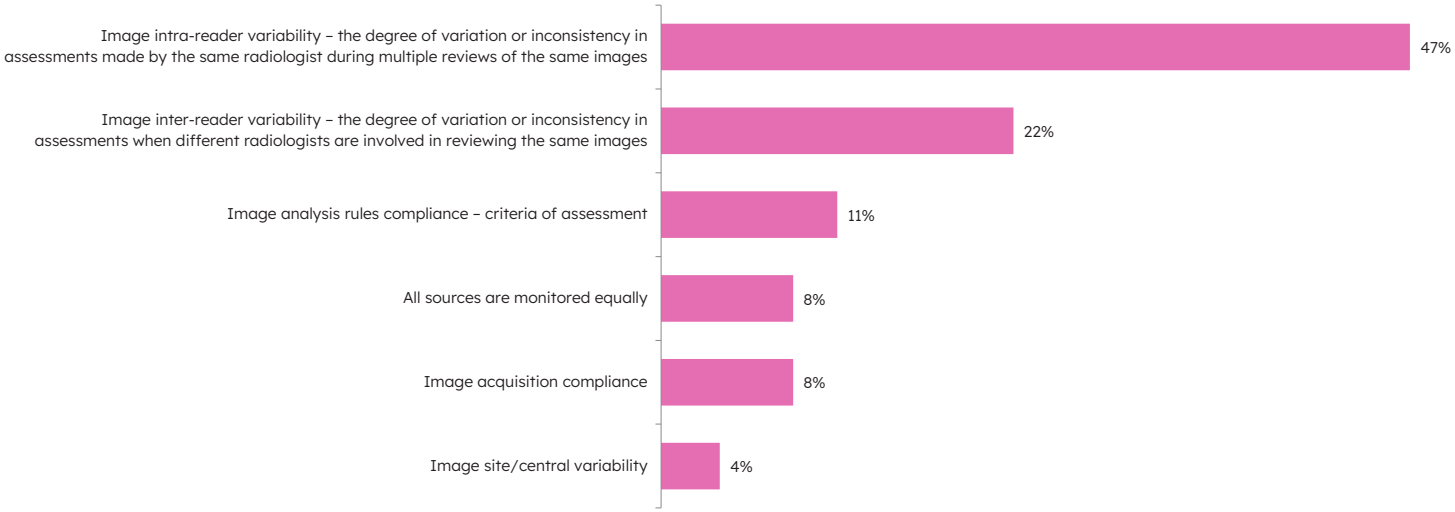

**Question: What are the primary challenges to using central reads in oncology clinical trials? (Please select 3 primary challenges)**
Base: All respondents; three answers permitted (n=110).

Despite the challenges, BICR is necessary to ensure efficacy. Survey respondents report that having a central reader helps to manage the growing complexity associated with image reading, as 'Quality control' is perceived as the main driver for using central reads, followed by 'Complex imaging criteria', 'Operational Efficiency' and 'Regulatory compliance' (Figure 3).

### Managing Imaging Read Variability

There are various sources for image read discrepancies in oncology clinical trials. According to the survey, nearly half of respondents are currently monitoring 'Image intra-reader variability', whereas only 22% are monitoring 'Image inter-reader variability' (Figure 4).

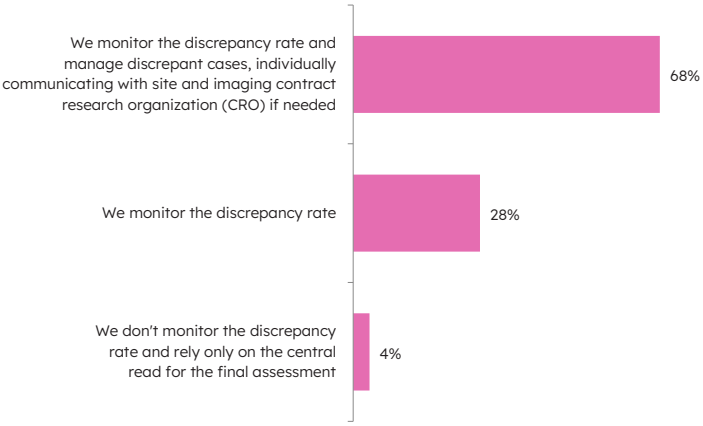
## Figure 4. Monitoring Variability And Errors Sources




**Question: Which of the following sources of variability and error are monitored the most in your oncology clinical trials?**
Base: All respondents (n=119). Note: 'Don't know' not included (n=1).

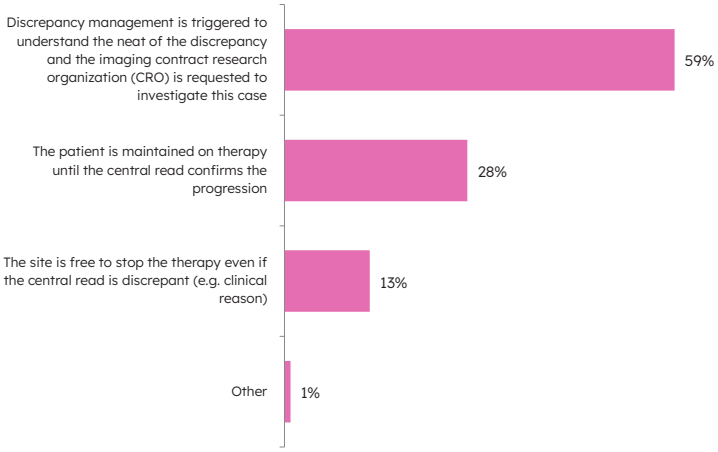
## Figure 5. Site And Central Read Discrepancy Management

### Managing Site and Central Reads Discrepancies




**Question: How does your company manage discrepancies between site and central reads?**
Base: All respondents (n=110).

### Vendor Selection




**Question: During a trial with a central confirmation of radiological progression, how do you manage patients when the central read does not confirm a site radiological progression.**
Base: All respondents (n=109).

Regardless of which type of variability the industry is monitoring more, the survey found that the following metrics are all considered highly important to monitoring the quality of image reads: 'Central study adjudication rate', 'Central reader endorsement rate', 'Central inter-reader discrepancy rate', 'Site/central discrepancy rate', 'Central reader adjudication rate', and 'Central intra-reader discrepancy rate'.

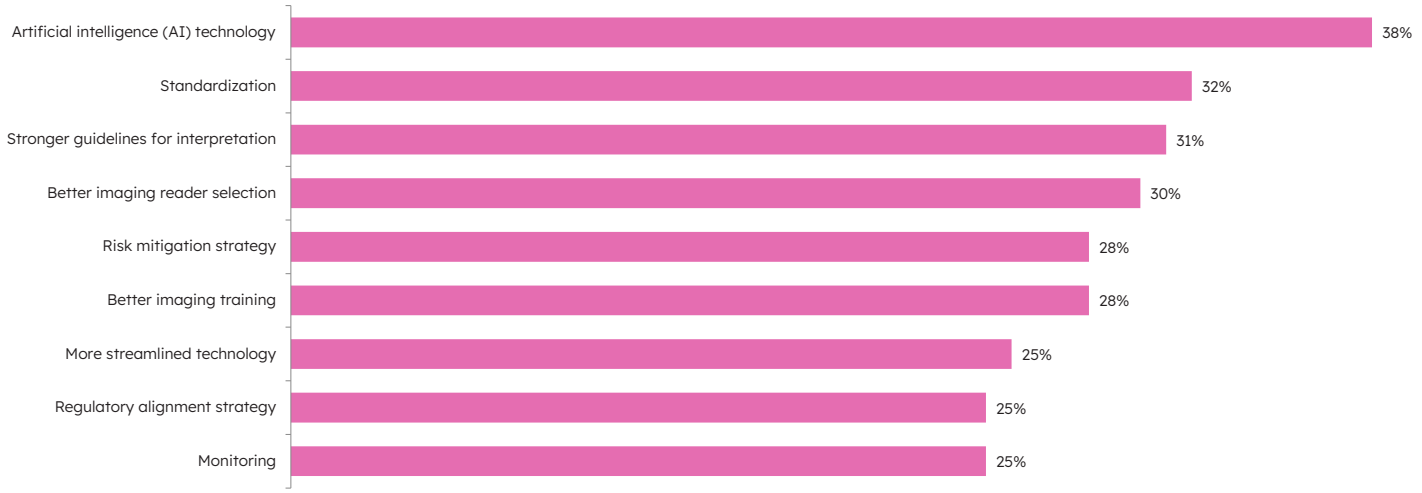
Survey results also showed that central imaging service providers not only support sponsors with the startup and image read workflow, but they guide pharma companies through managing image read variability as well. 68% of respondents monitor discrepancies between site and central readers by monitoring discrepancy rates in addition to managing cases of discrepancy (Figure 5), all while communicating with imaging contract research organizations (iCROs) when appropriate.

Additionally, 58% of respondents rely on discrepancy management to manage patients when the central read does not confirm radiological progression (Figure 5), using a central imaging services provider for further investigation where needed. This aligns with Median's experience. Their clinical trial imaging business is comprised of operational and scientific experts with successful experience in 90+ Phase III oncology studies where central imaging is critical to the outcomes of the drug.

Organizations are seeing the value of strategic partnerships, with most survey respondents feeling that their central imaging providers are adequately controlling image read variability. That being said, 68% of survey respondents still retain or hire radiologists to review images in oncology clinical trials, on top of outsourcing to the site and the imaging services provider.

Selecting an imaging services provider is of utmost importance, as there are many factors to think about when optimizing image reading, including technological capabilities, regulatory compliance and expertise, among others. Providers can enhance the strength of a study by offering support and guidance when selecting imaging criteria and determining which readers and sites are qualified. Furthermore, they can manage high volumes of data and use advanced technologies to analyze them so that image read variability is managed efficiently.[3]

**Figure 6. Improving Site And Central Read Discrepancies**




**Question: What are the primary ways that could improve site versus central read discrepancies in the future? (Please select up to 3 primary improvements)**
Base: All respondents; three answers permitted (n=110).

## Forward Looking: Perspectives On Using AI For Image Reading

As the industry continues to work tirelessly to improve methodologies for image reader discrepancies and adjudication in oncology clinical trials, life sciences organizations are considering what and how advanced technologies can help in the effort to enhance monitoring and improve image read variability. It is possible that advanced technologies, such as machine learning, can be used to predict inter-read discrepancies in the future.[2]

Survey respondents perceive that artificial intelligence (AI) is the primary way to improve site versus central read discrepancies in the future, followed by 'Standardization', 'Stronger guidelines for interpretation' and 'Better image reader selection' (Figure 6).

AI can have a major impact on oncology clinical trials.[4] When it comes to image read discrepancies in particular, AI has the ability to transform the process in a multitude of ways, including improving the precision and accuracy of image collection within a site, and performing a more informed and unbiased assessment of the radiographic images based on set criteria.

These advanced AI technologies also have the capacity to handle high volumes of patient data amidst tight deadlines. 60% of survey respondents, for instance, prefer turnaround times of image reads within one week. Furthermore, AI has the potential to aid in the effort of using central reads to determine patient eligibility and radiological progression, an approach that 93% and 89% of survey respondents said they would consider for future trials, respectively.

In a time when precision medicine and patient-centricity are at the forefront of oncology clinical trials, AI could be imperative for identifying patients who fit the specific criteria for receiving targeted therapies as well as identifying patients of diverse backgrounds.

## Outlook

Variability in clinical trial image reading remains an important topic in oncology drug development, as demonstrated in the key findings of Citeline and Median Technologies' survey. Although image read variability is inevitable and essential within a clinical trial, it is still an area that causes challenges due to the complexities involved in managing discrepancies.

The industry continues to leverage the expertise of central imaging providers like Median to support these complexities, but they are also keen on exploring how AI can assist. AI has the potential to transformatively impact various aspects of imaging in oncology trials. The hard part is figuring out how AI and human talent can work together to produce the most accurate results that ensure the safety and efficacy of innovative therapies.

AI may have the ability to concretely impact image read discrepancies and based on the survey's results, the industry is optimistic about the future of technology to support oncology clinical development.

## Resources


1. Drug Discovery & Development. *Top pharma companies ranked by 2023 R&D spend* (2024). https://www.drugdiscoverytrends.com/top-pharma-companies-2023-rd-spend/
2. Median Technologies. *Can we predict discordant RECIST 1.1 evaluations in double read clinical trials?* (2023) https://mediantechnologies.com/wp-content/uploads/2023/10/Can-we-predict-discordant-RECIST-1.1-evaluations-in-double-read-clinical-trials.pdf
3. Median Technologies. *Selecting the best imaging CRO* (2017). https://mediantechnologies.com/wp-content/uploads/2017/04/MT-Checklist-Top-8-Criteria-Final-v1.5.pdf
4. LinkedIn. *5 Transformative Way AI-Powered Imaging Can Positively Impact Oncology Clinical Trials* (2024). https://www.linkedin.com/pulse/5-transformative-ways-ai-powered-imaging-can-impact-oncology-jacques-xpp7e/?trackingId=s2aNluVxRheUkvVJHBTprQ%3D%3D

Pioneering in innovative imaging solutions and services, Median Technologies harnesses cutting-edge AI to elevate the accuracy of early cancer diagnoses and cancer treatments. Median's offerings, including iCRO for medical image analysis and management in oncology trials and eyonis™, AI/ML tech-based suite of software as medical devices (SaMD), empower biopharmaceutical entities and clinicians to advance patient care and expedite novel therapies. The French-based company, with a presence in the U.S. and China, is listed on the Euronext Growth stock exchange (ISIN: FR0011049824, ticker: ALMDT). Median is eligible for the French SME equity savings plan scheme (PEA-PME).

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