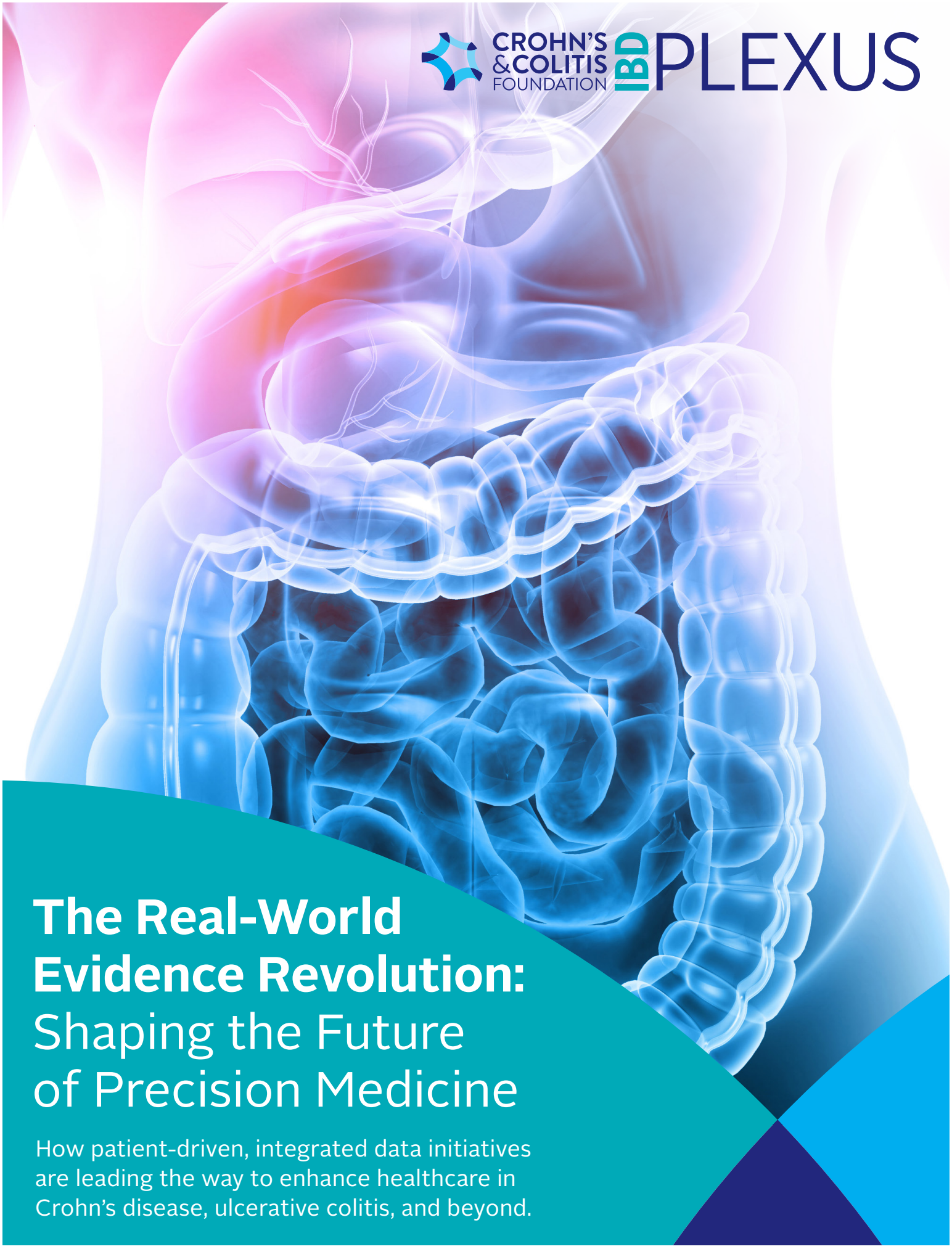

CROHN'S & COLITIS FOUNDATION IBD PLEXUS

The Real-World Evidence Revolution: Shaping the Future of Precision Medicine

How patient-driven, integrated data initiatives are leading the way to enhance healthcare in Crohn's disease, ulcerative colitis, and beyond.

The Real-World Evidence Revolution: Shaping the Future of Precision Medicine

How patient-driven, integrated data initiatives are leading the way to enhance healthcare in Crohn's disease, ulcerative colitis, and beyond

Breaking Silos, Building Solutions: The IBD Plexus Data Revolution

Despite the promise of big data and AI in medicine, there remain persistent challenges such as rising healthcare costs, barriers to accessing timely care, and inefficiencies in integrating new research findings into clinical practice. These issues are particularly pronounced in the management of chronic conditions like Crohn's disease and ulcerative colitis, where meaningful progress hinges on placing patients and their data at the center of innovation.

Nearly one in 100 people in the U.S. has inflammatory bowel disease (IBD), the umbrella term used to describe disorders that cause chronic inflammation of the gastrointestinal (GI) tract, including Crohn's disease and ulcerative colitis. Despite advancements in treatments, many patients still face significant unmet needs. Persistent symptoms, reduced energy, psychological distress, and concerns about long-term medication effects continue to impact patients' quality of life. Furthermore, hospitalization and surgical rates remain high (1). A comprehensive understanding of the patient—from genetics to patient-reported outcomes is critical to unraveling these challenges.

A key barrier to addressing these challenges has been the fragmentation of data across disconnected healthcare systems, which slows research and innovation. The Crohn's & Colitis Foundation's novel research accelerator, IBD Plexus®, tackles this challenge by breaking down data silos and democratizing access to longitudinal, multimodal datasets from clinical settings and labs. Most critically, it integrates molecular data with the patient voice to ensure their experiences and perspectives shape research and treatment advancements.

By uniting patients, clinicians, academia, and the life science industry within a unique research network, the Crohn's & Colitis Foundation accelerates discovery and translation of precision medicine strategies into clinical practice. This collaborative approach ensures that research is patient-centered, driving innovation that directly improves outcomes, and

addresses the most pressing gaps in IBD care. IBD Plexus data has already led to over 200 publications.

For over 100 academic researchers and more than 40 BioPharma industry partners, IBD Plexus provides access to high-quality, research-ready datasets, cutting-edge products, and real-time insights that are reshaping IBD care. The platform's scale and technological integration position it uniquely to address urgent challenges in diagnosis, treatment, and health outcomes.

IBD Plexus—Research-Ready Data Informed by Patient Insights

IBD Plexus houses the world's most comprehensive collection of IBD patient data and biosamples, bridging translational gaps between immune pathway-targeted innovations and lifelong remission, including patient-prioritized symptoms like pain and fatigue. The aim is to provide a comprehensive understanding of IBD that extends beyond the gut to include extraintestinal manifestations, psychosocial burdens, improved long-term remission metrics, and, eventually, cures.

Designed to unify fragmented data, IBD Plexus systematically aggregates and harmonizes research-grade information from diverse sources typically siloed in healthcare systems. In just seven years, IBD Plexus has compiled hundreds of millions of clinical and molecular datapoints. While electronic health records (EHRs) remain optimized for administrative and billing tasks, IBD Plexus closes this divide by curating clinically meaningful data collected during routine care - including granular patient-reported symptoms, longitudinal disease activity metrics, genetic and molecular datasets, endoscopic findings, histopathology images, and treatment response patterns that are critical for advancing precision medicine research. This unique approach addresses the inherent limitations of EHRs by intentionally capturing research-relevant variables during standard care visits, enabling unprecedented insights into disease mechanisms and treatment optimization.

The Crohn's & Colitis Foundation has played a role in every major IBD research breakthrough, and its research agenda is guided by patient input and experience. (2) Patients actively shape IBD Plexus research priorities through direct participation in both project selection and advisory committees. Their lived experience informs critical decisions for project approvals and areas of high research need, ensuring faster innovations where they are needed most.

Patient centricity is essential for advancing IBD research. Fostering trust, engagement, and collecting real-world data beyond the clinic are essential to breaking through current therapeutic limits and achieving lasting remission. IBD Plexus stands out as a preeminent research accelerator because tens of thousands of patients with IBD actively contribute their data. This patient-driven approach accelerates discoveries that directly address patient needs and paves the way for personalized, long-term treatment solutions.

“When clinical metrics overshadow patient-reported symptoms, costs, and care realities, medical progress remains incomplete,” said Angela Dobes, Crohn’s & Colitis Foundation Senior Vice President, IBD Plexus. “Traditional real-world datasets constrain medical innovation and leave researchers with fragmented insights. To advance healthcare, patients must be active partners in evidence creation—not merely data points,” said Dobes.

When it comes to chronic disease, patients are experts on their experience. By contributing their data to IBD Plexus, patients can feel confident that they are helping accelerate the development of targeted treatments and personalized care plans that truly reflect the realities of living with IBD.

Speeding Treatment Development in Crohn’s Disease and Ulcerative Colitis

IBD patients urgently need more effective and personalized treatments, but drug development remains a lengthy and complex process, leaving significant unmet needs in managing these challenging conditions. By connecting researchers with the right data, expertise, and technology, IBD Plexus cuts the time it takes to develop new treatments.

“IBD Plexus brings multimodal molecular and imaging data that is linked to and contextualized by clinically characterized patients directly to scientists looking to improve the lives of patients with Crohn’s disease and ulcerative colitis. These data are used every day to validate drug targets, discover new biomarkers, and optimize clinical trial design,” said Ben Kostiuk, director of life science partnerships, Crohn’s & Colitis Foundation. “Precision medicine can be realized for our patients by getting the right data in the hands of scientists, data and AI engineers, and clinicians. We are energized by the transformative power that IBD Plexus brings to complex challenges and the innovative solutions it creates.”

The database facilitates:

Drug target identification

Abdominal pain in IBD remains a highly prevalent and impactful symptom, yet significant gaps persist in understanding its pathophysiology and optimizing treatment strategies, compounded by a relative lack of comprehensive reviews and evidence-based guidelines.

Researchers at Johns Hopkins University are harnessing the power of IBD Plexus to unlock new therapeutic possibilities for inflammatory bowel disease. By tapping into rich, real-world biopsy transcriptomic data—paired with deep clinical phenotyping like endoscopic scores and patient-reported pain—they've validated GCPII as a promising new target in IBD with the potential to treat both the pain and inflammation associated with the disease. (3)

Thanks to IBD Plexus, the team was able to pinpoint subpopulations of patients where the gene encoding GCPII, folate hydrolase I, is significantly upregulated. This critical insight is only possible through the kind of multidimensional data integration that IBD Plexus enables.

Now, the lab is taking the next step—using matched tissue samples to investigate whether GCPII is also dysregulated at the protein level, potentially paving the way for a novel, biomarker-informed therapeutic approach in IBD.

Biomarker discovery and validation

A key challenge in IBD is a lack of understanding of which medicines will work for which patients at which time. Biomarkers act as a roadmap to match the right care to each patient's unique needs, connecting drug development to real-world impact by ensuring therapies reach those who will benefit most.

At Harvard, researchers used IBD Plexus to improve treatment decision-making in ulcerative colitis. By leveraging IBD Plexus' powerful sequencing data and longitudinal clinical records, the team uncovered microbiome-derived enzymes that inactivate 5-ASA, a frontline therapy for ulcerative colitis—revealing why it fails in certain patients. (4)

This breakthrough, accelerated by IBD Plexus, opens the door to more personalized treatment strategies. Clinicians may soon be able to identify, up front, which patients are unlikely to benefit from standard therapies, shortening the trial-and-error window and accelerating access to more advanced treatments.

It's one of the first real-world examples of how the microbiome can drive precision medicine in IBD— and it wouldn't be possible without IBD Plexus.

Clinical trial enrollment

Recruitment challenges for Crohn's disease and ulcerative colitis clinical trials persist. Recent analysis shows that sites enroll approximately one participant annually, highlighting systemic issues like flawed trial design and restrictive inclusion/exclusion criteria, which necessitate hundreds of sites to meet enrollment targets. (5)

IBD Plexus can provide the data necessary to find the right participants for a clinical trial. A pharmaceutical industry research team used linked clinical and molecular data in IBD Plexus to refine inclusion and exclusion criteria for a Crohn's disease trial to inform a precision medicine approach. (3)

Distinct patient clusters were identified by different clinical variables, such as penetrating, stricturing, and non-stricturing, sCDAI severity score, and surgical history. The researchers found molecular signatures that correlated with the groups on a heatmap, resulting in a biomarker strategy that helped identify the right patient subpopulations for the trial, saving time and money on recruiting patients.

Advancing personalized medicine

For the 25-40% of IBD patients battling debilitating extraintestinal manifestations beyond the gut—from crippling joint inflammation to vision-threatening eye disorders and life-threatening organ damage—advancing personalized medicine demands systemic solutions as multifaceted as their disease. (6)

A researcher turned to IBD Plexus to test a hypothesis that Crohn's patients presenting with extraintestinal symptoms are harder to treat.

Using IBD Plexus, researchers accessed richly phenotyped, real-world information—mapping where disease occurs in the gut, detailing past surgeries, and tracking the full history of therapies each patient has failed. This comprehensive view revealed a clear pattern: patients with extraintestinal manifestations are significantly more likely to cycle through multiple biologics, confirming their more treatment-refractory profile. (7)

These findings empower clinicians to make smarter, faster treatment decisions, especially when considering advanced therapies for Crohn's patients with complex presentations. It's a step forward in ensuring the right patients get the right treatment, sooner.

The Tech Connection

As the volume and complexity of data grew, it became clear that traditional tools and workflows were no longer enough. Scientists were spending more time managing data than

generating insights. At the same time, AI and advanced analytics were becoming increasingly embedded in life sciences. The research community had to evolve.

Rather than trying to build everything in-house, the Crohn's & Colitis Foundation made a strategic decision: to partner with best-in-class organizations that could help unlock the full potential of its data. We've focused on areas where we can maximize impact—examples include, computational disease models with CytoReason, AI-powered histology with PathAI, clinical trial optimization with Phase V, and scalable infrastructure for data exploration on Databricks.

These partnerships are helping us move from being data-rich to insight-driven, enabling faster, more precise, and more patient-centric research. And as the field continues to evolve, so will our collaborations—always guided by the goal of delivering real value to patients and the people working to help them.

Guiding healthcare utilization decisions

Understanding when to invest in critical health measures—and when patient safety justifies additional protocols—is essential for optimizing care pathways.

At the University of Pennsylvania, researchers used IBD Plexus to answer an important question in treatment safety: Is routine tuberculosis screening still necessary before prescribing IBD therapies?

In a region with low TB prevalence, physicians were skeptical. But by tapping into IBD Plexus' broad, real-world dataset, researchers were able to assess TB screening results across a diverse, national patient population. The data told a different story: a meaningful number of patients with IBD do test positive for TB, particularly in higher-prevalence areas. (8)

This insight, only possible through the scale and depth of IBD Plexus, helped physicians recognize the importance of routine TB screening—not just as a regulatory box to check, but as a key step in ensuring safe and effective treatment decisions for their patients.

From Fragmented Records to Full Stories: Building the Future of IBD Discovery

Without addressing systemic challenges, like EHR fragmentation and retrospective data limitations, advancements in personalized treatments and preventive care stall, leaving AI-driven solutions and optimized health outcomes unrealized.

The 2025 State of Observational Research Report surveyed life sciences companies and found that for 60%, their top research priority is long-term follow-up studies. (9)

“In prospective research, the true supply chain isn’t just materials and logistics—it’s the clinicians, site staff, and patients whose sustained engagement fuels discovery. Optimizing this human network demands reducing burdens through seamless collaboration, intelligent design, and unique engagement offerings,” Dobes said. “That’s where IBD Plexus thrives: its integrated ecosystem transforms fragmented efforts into longitudinal momentum, aligning clinician insights with patient realities to accelerate breakthroughs.”

The survey also found that 57% of life sciences companies prioritize access to hard-to-find data. This is where prospective research becomes critical for IBD studies, as key details—such as phenotype, disease location, endoscopy scores, and longitudinal progression—are absent from administrative EHR systems and claims codes.

In addition, sixty-four percent of survey respondents indicated that their top challenge when conducting observational research was incomplete data. (9) IBD Plexus data includes patient-reported outcomes, longitudinal clinical and multiomic data, with the ability to progressively build the data into more complex datasets, such as emerging molecular data, biometric measurements, and environmental exposure information. Additionally, it supports recontacting patients for deeper insights, enabling follow-up studies. This comprehensive approach allows tracking of specific treatments patients receive, including medication changes and dosing, alongside clinical outcomes. By combining these diverse data types, IBD Plexus creates a rich, evolving resource to study treatment effects, disease progression, and patient experiences in a real-world setting.

Join the revolution and learn more about IBD Plexus.

References

1. Inflammatory Bowel Disease (Overview). Cleveland Clinic. May 20, 2024. https://my.clevelandclinic.org/ health/diseases/15587-inflammatory-bowel-disease-overview

2. Haan, L. The power of the patient voice. Crohn's & Colitis Foundation. Dec. 19, 2023. https://www. crohnscolitisfoundation.org/blog/the-power-of-the-patient-voice

3. IBD Plexus. IBD Plexus Use Cases. Crohn's & Colitis Foundation. 2025.

4. Mehta, R.S., Mayers, J.R., Zhang, Y. et al. Gut microbial metabolism of 5-ASA diminishes its clinical efficacy in inflammatory bowel disease. Nature Medicine. Feb. 23, 2023. https://doi.org/10.1038/s41591-023-02217-7

5. Solitano, V., Prins, H., Archer, M., et al. Toward patient centricity: Why do patients with inflammatory bowel disease participate in pharmaceutical clinical trials? A mixed-methods exploration of study participants. Crohn's & Colitis 360. March 15, 2024. https://pmc.ncbi.nlm.nih.gov/articles/PMC11003535/

6. Extraintestinal Complications of IBD. Crohn's & Colitis Foundation. https://www.crohnscolitisfoundation.org/ what-is-ibd/extraintestinal-complications-ibd

7. Alizadeh, M., Ali, O., Cross, R. Extraintestinal manifestations of inflammatory bowel disease are associated with increased biologic cycling. Crohn's & Colitis 360. Oct. 4, 2023. https://pubmed.ncbi.nlm.nih.gov/37901191/

8. Lapp, S., Bewtra, M., Lewis, J. Yield of serial testing for tuberculosis exposure in patients with inflammatory bowel diseases: One test is not enough. Clinical Gastroenterology and Hepatology. February 2024. https://www.cghjournal.org/article/S1542-3565(23)00481-0/fulltext

9. 2025 Annual State of Observational Research Report. PicnicHealth. 2025. https://research.picnichealth. com/2025-annual-state-of-observational-research-report