

# From Data Chaos to Clinical Clarity:

## *Clinical Intelligence™ Powers Data-Driven Healthcare Decision-Making*

Authored by Milliman Pluritem  
[Careflowiq.info@milliman.com](mailto:Careflowiq.info@milliman.com)

Discover how to transform fragmented healthcare data into trusted, proven **Clinical Intelligence™**



# Introduction

When healthcare providers have evidence-based insights into patient health, they are empowered to make informed decisions that enable the delivery of the best possible care, optimize outcomes and contain costs — regardless of their contracting agreements or scope of care delivery.

Achieving these insights into patient health has been elusive since providers rarely have access to the right data, the right data platform and the right analytic tools to successfully navigate the complexities of the current healthcare landscape.

The demand is not just for more data — but for data that is clean, structured and clinically valid.

A multi-disciplinary team of technology experts and healthcare professionals at Milliman CareFlowIQ™ developed this white paper to contextualize the value of its proprietary **Clinical Intelligence™** that supports providers in delivering high-value care. This document will help readers to understand the role of this intelligent data: to overcome the challenges of poor clinical data and take advantage of opportunities to implement solutions that unlock the value of data for distinct healthcare settings that include but are not limited to:

- Self-Insured Stakeholders
- Direct Primary Care Providers
- Telemedicine Programs
- On-site Corporate Clinics



We welcome your feedback and look forward to speaking to you personally about overcoming your data challenges.

[Contact Us](#)



## Diagnosing the Data Dilemma

Healthcare organizations operate in many settings that all share the same goal of making informed, confident decisions that improve outcomes, control costs and enhance the patient experience. Meeting this goal demands more than just access to data. It requires trusted, timely and clinically valid insight that's usable at the point of care.

Despite billions invested in digital health, data usability remains a core barrier. This results in a fragmented healthcare ecosystem where data is either scattered across various systems or buried under layers of complexity, making it difficult for providers to access the complete picture needed for informed decision-making. Providers face increased administrative burden, delays in patient onboarding and uncertainty in clinical decision-making (Zhou & Li, 2023). The consequences extend further to artificial intelligence (AI) and value-based care initiatives, which depend upon complete and accurate information and struggle to deliver on their promise without trusted data foundations (Anders, 2025).

**The urgency is clear. Over 80% of physicians report not trusting the data they receive about their patients (Healthcare Innovation, 2023). An estimated 97% of healthcare data goes unused (World Economic Forum, 2024). These gaps don't just slow care, they lead to missed diagnoses, delayed interventions and avoidable complications.**

This white paper explores the structural issues behind poor clinical data quality, the limitations of traditional health data approaches and the opportunity to transform healthcare data into real-time Clinical Intelligence™. For organizations seeking to modernize decision-making and improve care delivery at scale, the ability to operationalize clinical data is no longer optional, it's foundational.

## Addressing Market Challenges

### Clinical Data: Essential but Underused and Undervalued

Clinical data spans diagnoses, medications, lab results, imaging, provider notes, social determinants of health (SDoH) and increasingly, wearable and home-monitoring inputs. This data—if standardized and validated—holds immense value for both personalized care and population health strategies. Yet in many health systems, it remains locked behind outdated formats, inconsistent terminologies and siloed infrastructure.

Legacy health IT systems were never built to prioritize clinical usability. As a result, the richness of this data is often wasted. Before any analytics, automation or AI can deliver impact, the data must first be trusted, normalized, reconciled and validated for real-world use.

### The Cost of Poor Data Quality

Organizations are investing in digital tools, but these tools are only as effective as the data they run on. Inconsistencies, duplication and outdated information erode confidence in outputs. Clinical decision-making slows. AI and analytics fail to deliver. The root problem isn't the technology—it's the data quality.

High-quality clinical data is more than a technical asset. It is essential to both clinical performance and business success. When data is incomplete or unreliable, the effects are felt across every area of healthcare operations.

- **Clinician Burden:** Physicians spend excessive time verifying or correcting incomplete records, time that could be spent with patients.
- **Interoperability Breakdowns:** Data passed between systems arrives in formats that lack standardization or validation.
- **EHR Limitations:** Most systems are optimized for billing, not care delivery or insight.
- **Business Inefficiency:** Outdated provider data costs billions in rework and network inaccuracies.
- **Population Health Blind Spots:** Without longitudinal, trusted records, gaps persist and risk models misfire.
- **Terminology Mismatch:** Disconnected coding and language structures sabotage cross-team coordination.
- **AI Shortfalls:** Machine learning models falter when fed low-fidelity data that was never intended for clinical insight (Sage Growth Partners, n.d.).

These problems are not isolated. They are embedded across the system and demand a coordinated, system-wide solution.



## The Usability Divide

Clean, structured data is only half the equation. For information to impact care, it must be surfaced in ways that are intuitive, context-aware and usable in real time. In healthcare, where minutes matter and cognitive overload is high, the user interface (UI) isn't just a design choice, it's clinical infrastructure.

Despite advancements in health data standards like Fast Healthcare Interoperability Resources (FHIR), most clinicians still interact with systems that still interact with legacy systems and outdated practices (eCQI Resource Center, n.d.). They're navigating cluttered displays, static PDFs and disjointed dashboards that slow decision-making rather than supporting it (Landi, 2025). In contrast to other industries, healthcare continues to tolerate inefficiencies that compromise outcomes.

A modern UI does more than display data:

- Prioritize and surface the most relevant clinical information at the right time.
- Reduce manual administrative burdens, friction and confusion that lead to errors or inaction.
- Enable collaboration across teams and care settings with shared, real-time views.
- Support documentation, chronic care management, risk scoring and care coordination, without overwhelming the user.

For patients, strong UI design supports engagement. Health information becomes more transparent, accessible, and actionable. For clinicians, it relieves administrative burden and accelerates the speed to action.

## Addressing the Limitations of Claims Data

Claims data, while structured, is primarily designed for billing. It offers limited clinical context, lags by 90–120 days and omits details essential to care planning, such as lab results, progress notes or patient-reported symptoms (Sage Growth Partners, n.d.). By contrast, clinical data provides a real-time, narrative-driven picture of a patient's health, enabling early intervention and accurate, personalized care.

However, raw clinical data is often messy. It arrives in outdated formats, lacks standardized terminology and includes duplicate or contradictory records. To unlock its potential, a clinical data platform takes the raw data and provides clean, normalized and insightful clinical intelligence.

# Clinical Data vs. Claims Data

Feature	Clinical Data	Claims Data
Source	EHRs, medical records	Health insurance claims
Scope	Comprehensive patient history, diagnoses, treatments, and more	Limited to billing information and encounters
Timeliness	More up-to-date, providing a real-time view of patient health	May lag 90-120 days behind, as claims are submitted after services are rendered
Clinical Context	Rich clinical details, including disease progression, comorbidities, and treatment patterns	Lacks detailed clinical context, often focusing on procedures and medications
Research Use	Rich clinical details, including disease progression, comorbidities, and treatment patterns	Cost analysis, economic evaluations, research on treatment patterns and outcomes, and understanding healthcare utilization
Limitations	May require specialized skills and infrastructure to analyze, especially unstructured data	Lacks detailed patient information and may not fully capture the nuances of care

## Understanding Key Differences

- **Source:** Clinical data comes from real-time interactions, EHRs, labs, physician notes and devices. Claims data is generated after the fact, through billing processes.
- **Scope:** Clinical data reflects the full patient journey, from diagnostics to care plans, including non-billable but clinically relevant inputs like SDoH. Claims capture only reimbursed services.
- **Timeliness:** Clinical data is available in near real-time. Claims often arrive too late to inform immediate care decisions.
- **Clinical Context:** Clinical data includes the “why” behind medical actions, diagnoses, outcomes, and provider rationale. Claims data provides a transactional summary that often lacks nuance.
- **Use Cases:** Clinical data powers decision support, chronic care management, care gap closure, and proactive population health. Claims data is more suitable for cost analysis and utilization reporting.
- **Limitations:** Clinical data must be normalized to be actionable at scale. Claims data is structured but lacks clinical depth and can misrepresent patient needs due to coding incentives.



## Turning Raw Data into Clinical Intelligence(TM)<sup>TM</sup>

Clinical Intelligence<sup>TM</sup> bridges this gap, transforming fragmented clinical data into high-fidelity insight that is standardized, reliable and ready to drive action (Healthcare Innovation, 2023). Where claims data answers “what happened,” Clinical Intelligence<sup>TM</sup> sets up providers to make informed decisions.

This distinction is critical for modern healthcare systems aiming to shift from reactive, cost-centered operations to proactive, data-driven decision making.



**Unlocking the Value of Clinical Data** As healthcare organizations pivot toward proactive, patient-centered models, the ability to unlock and operationalize clinical data has become a strategic imperative. High-fidelity Clinical Intelligence<sup>TM</sup> has become the foundation for scalable innovation, better outcomes and more cost-effective care.



**Transforming Disconnected Records into Meaningful Intelligence** Clinical data often arrives in formats that are inconsistent and hard to use—scanned documents, faxes, PDFs, lab feeds and free-text notes from electronic health records. Aggregating these sources doesn’t make them useful. To deliver real insight, the data must be normalized for consistency, validated for accuracy and structured for immediate action. Once transformed, it becomes a longitudinal patient narrative that shifts providers from responding to fragmented episodes to managing whole-person health with clarity and confidence.



**Delivering Insight When and Where It’s Needed** With clean, real-time data, care teams can close gaps, reduce errors and act with greater confidence. Clinical Intelligence<sup>TM</sup> helps identify missing labs or overdue follow-ups, supports more accurate risk stratification and allows for care plans tailored to each patient’s current condition and health history. It also improves collaboration by giving providers access to a shared, always-current view of the patient, regardless of where or how care is delivered.



**Creating Measurable Value Across Healthcare Models** In every setting, Clinical Intelligence™ does more than improve care, it redefines what care can accomplish. When data is no longer fragmented or delayed, it becomes the engine that drives better outcomes, lower costs and stronger connections across the healthcare ecosystem.



**Direct primary care providers rely upon** Clinical Intelligence™ to streamline onboarding, help flag chronic risks earlier and support individualized plans of care grounded in longitudinal data. It also provides the documentation clarity needed for value-based care contracts.



**On-site and near-site clinics** use this intelligence to reduce duplicative testing, implement targeted wellness initiatives and demonstrate their value to employers with real-time analytics and outcome tracking.



**Self-insured employers** benefit from a clearer view of clinical risk within their populations. With access to validated data, they can move beyond claims summaries to evaluate provider performance, identify chronic condition trends and shape smarter benefit strategies.



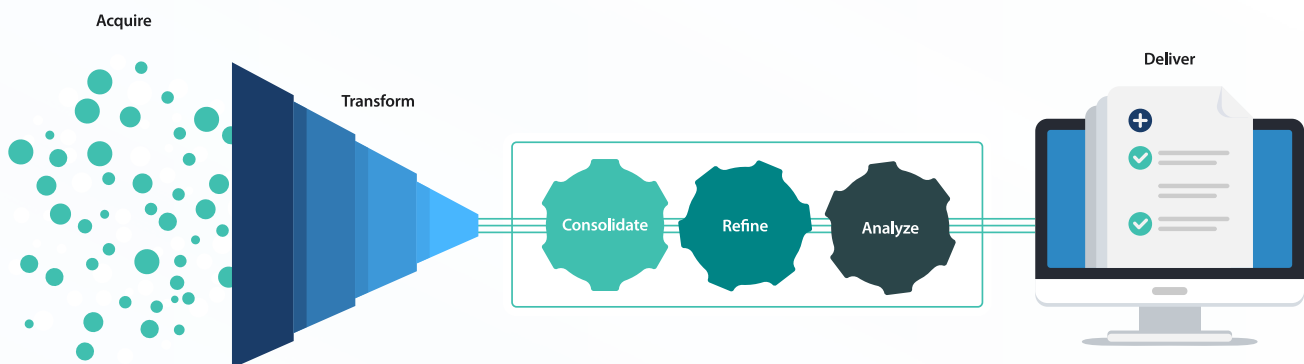
**Virtual care programs** also gain significant advantages. With access to longitudinal records and real-time updates from remote monitoring tools, telemedicine providers can offer safer, more consistent care. They can maintain continuity across visits, make more accurate diagnoses and act on emerging risks as they appear.



## Milliman CareFlowIQ™: Built for the Realities of Healthcare

Milliman CareFlowIQ™ was built to handle the healthcare system as it exists today, not an idealized version. In a landscape still dominated by PDFs, scanned faxes, fragmented infrastructure, and legacy EHRs, this platform provides a scalable, pragmatic solution. It transforms inconsistent records into clean, validated insights that clinicians can trust, delivered in real time through intuitive interfaces or seamlessly integrated into existing systems via APIs.

Milliman CareFlowIQ™ is designed to handle the full complexity of clinical data, focusing not just on access but on usability. Its data pipeline validates, enriches and reconciles this information to produce high-fidelity Clinical Intelligence™ that supports immediate, informed action. It ingests structured EHR fields, unstructured notes, specialist reports, imaging, remote monitoring feeds and referrals. Through advanced normalization, deduplication and validation, these varied inputs are synthesized into a longitudinal, clinically sound record, the Whole Patient View™. This comprehensive profile delivers timely, relevant insights directly into clinical workflows.



More than just aggregating data, Milliman CareFlowIQ™ prioritizes what matters: diagnoses, lab results, medications, risk indicators and care gaps. It presents these insights in structured, actionable formats that support decision-making, chronic care management and coordination across teams. Rather than serving as a static repository, the platform functions as a decision engine, enabling fast, confident clinical action.

Interoperable by design and scalable by nature, Milliman CareFlowIQ™ aligns with standards, including the FHIR data standard and API for exchanging health information electronically. It integrates across a range of use cases, from population health and value-based care to AI-enabled decision support, regulatory reporting and virtual care infrastructure. For payers and self-insured employers, it delivers clinical clarity that goes beyond what claims data alone can provide, offering a deeper view into provider performance and population risk.

## What CareFlowIQ Has Achieved and What's Next

Milliman CareFlowIQ™ is changing how healthcare organizations access, interpret and use clinical data. By turning scattered, incomplete records into high-fidelity intelligence, the platform helps providers and stakeholders deliver faster, more connected and more effective care.

### Proven Impact Across Care Settings

Milliman CareFlowIQ™ has delivered measurable results across a range of environments. It reconciles structured and unstructured data, from EHR fields to handwritten notes and scanned records, into standardized, validated formats ready for use at scale. By highlighting only the most relevant information, diagnoses, labs, medications and care gaps, it reduces administrative burden and helps clinicians focus on delivering care.

The platform also shortens onboarding time by making a complete clinical history available from day one. It identifies care gaps as they emerge, enabling timely intervention in line with value-based care goals. At the population level, it supports chronic disease management and risk stratification through longitudinal, clinically validated narratives.

### Looking Ahead: Built for Strategic Collaboration

Milliman CareFlowIQ™ is more than a data platform, it's a foundation for intelligent care. Its continued impact depends on collaboration across the healthcare ecosystem. Milliman is focused on advancing this work in several key areas.

The platform is expanding adoption of the Whole Patient View™ to enable more integrated, patient-centered care across provider systems and health plans. It is deepening interoperability through stronger alignment with emerging data standards and ongoing enhancement of API capabilities.

To support innovation, Milliman CareFlowIQ™ delivers the validated, high-fidelity data needed to power safe and effective AI tools. It also equips care teams with consistent insight to drive long-term patient engagement and condition management. For payers and employers, it unlocks the clinical clarity required to manage risk, evaluate performance, and make more strategic decisions.

Transforming healthcare starts with trusted Clinical Intelligence™. Providers, payers, health systems, employers and innovators are invited to make Milliman CareFlowIQ™ their foundation for data-driven care. By converting fragmented records into actionable insight, the platform supports smarter decisions, better outcomes and a future where data truly works for care.







## References

1. Zhou, L., & Li, Z. (2023). *Improving health data usability for patient care and research*. National Library of Medicine. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10134123/>
2. Anders, J. (2025, May 5). *Health care's data problem: The real obstacle to AI success*. KevinMD. <https://kevinmd.com/2025/05/health-cares-data-problem-the-real-obstacle-to-ai-success.html>
3. Healthcare Innovation. (2023, October 24). *Interoperability's dirty little secret: Your doctor doesn't trust your data*. <https://www.hcinnovationgroup.com/interoperability-hie/interoperability/blog/55294356/interoperabilitys-dirty-little-secret-your-doctor-doesnt-trust-your-data>
4. World Economic Forum. (2024, January). *How to harness health data to improve patient outcomes*. <https://www.weforum.org/stories/2024/01/how-to-harness-health-data-to-improve-patient-outcomes-wef24/>
5. Sage Growth Partners. (n.d.). *Bad data, bad decisions: The business impact of inaccurate provider data*. <https://go.sage-growth.com/bad-data-bad-decisions-report-pdf>
6. eCQI Resource Center. (n.d.). *FHIR overview*. Office of the National Coordinator for Health IT. [https://ecqi.healthit.gov/fhir?qt-tabs\\_fhir=about](https://ecqi.healthit.gov/fhir?qt-tabs_fhir=about)
7. Landi, H. (2025, May 2). *Inaccurate provider data: The biggest obstacle to value-based care*. HIT Consultant. <https://hitconsultant.net/2025/05/02/inaccurate-provider-data-the-biggest-obstacle-to-value-based-care/>

## About Milliman Pluritem

Milliman Pluritem is an innovative division of Milliman Inc. focused on unlocking the value of clinical data for the healthcare industry. Founded by industry veterans who led work at Apple and Amazon, Milliman Pluritem leverages cutting-edge technology to deliver clinical insights to the healthcare industry. The company's flagship product, Milliman CareFlowIQ is the superior, scalable clinical data platform that delivers clinical intelligence to healthcare's data chaos.

## About Milliman CareFlowIQ

Through a next-generation clinical data pipeline, CareFlowIQ transforms legacy formats and disconnected records into searchable, clean and context-rich insights. CareFlowIQ enables healthcare providers and health tech leadership to accelerate onboarding, identify care gaps, and make confident, data-driven decisions. Built to handle real-world complexity, CareFlowIQ extracts meaningful narratives from PDFs, even doctors' notes, to unlock relevant clinical insights in seconds, and support API integration or direct clinician use. It's not just more clinical data—it's clinical intelligence built around the complete patient story. Visit [www.CareFlowIQ.com](http://www.CareFlowIQ.com).

### Contact Information



[www.careflowiq.com](http://www.careflowiq.com)



[careflowiq.info@milliman.com](mailto:careflowiq.info@milliman.com)

Contact Us

*The complete patient story*

