



A Better Path: Open Standards

A Strategic Guide to
extracting complete data

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The Challenge: Fragmented EHR Ecosystems and Incomplete Data

Healthcare organizations today face a significant data fragmentation challenge. The average hospital operates with 16 disparate electronic systems, creating a complex ecosystem where information exists in various states of accessibility and standardization. This fragmentation creates substantial barriers to comprehensive data utilization, with approximately 80% of hospitals reporting difficulties extracting meaningful information from their EHRs according to research published in *JAMIA Open*.

Perhaps most concerning is that over half of clinically relevant data resides in unstructured formats - clinical notes, PDFs, scanned documents, and other non-standardized content that standard interoperability protocols struggle to access. This "dark data" represents a massive untapped resource for healthcare organizations seeking to optimize care delivery and operational efficiency.

What Standard Approaches Miss

- Custom EHR fields created during implementation to address specific organizational needs
- Non-standardized data types and local vocabularies developed for specialized workflows
- Unstructured text within physician notes containing valuable clinical narratives and insights
- Historical records stored in legacy or decommissioned systems predating current standards



Modern healthcare facilities typically manage numerous electronic systems, each capturing different aspects of patient care and organizational operations.

While EHR vendors have implemented HL7 and FHIR protocols to improve interoperability, these standards primarily address structured, discrete data elements. The limitations of this approach result in incomplete data capture, effectively hampering the full potential of analytics initiatives, AI/ML applications, quality reporting mechanisms, and comprehensive patient care insights that healthcare organizations desperately need to thrive in today's data-driven environment.

The Limitations of FHIR and HL7 Alone

FHIR (Fast Healthcare Interoperability Resources) represents a significant advancement in healthcare data exchange, designed to standardize how information moves between systems. However, despite its sophisticated design and growing adoption, FHIR implementations vary considerably across vendors. This inconsistency creates a paradoxical situation where a standard meant to unify data instead introduces new forms of fragmentation when organizations attempt to integrate multiple systems.

While FHIR is technically extensible, this flexibility can become a double-edged sword. Many EHR vendors selectively implement only portions of the FHIR specification or create non-standard extensions that limit true interoperability. Similarly, HL7 v2 messages remain deeply embedded in healthcare workflows but were originally designed for messaging rather than comprehensive data exchange, creating additional limitations when organizations need to extract complete datasets for analytics or research.

FHIR Coverage Limitations

FHIR APIs typically provide access to only 20-30% of all clinical data within an EHR system, leaving the majority inaccessible through standard interfaces.

Missing Clinical Context

Critical information including social determinants of health, detailed care team notes, and nuanced clinical impressions often remain outside FHIR's scope.

Legacy Data Gaps

FHIR is not retroactive; historical data predating FHIR adoption may not be available via API at all, creating blind spots in longitudinal analysis.

"While FHIR has moved the industry forward, it doesn't cover the entire spectrum of patient data. We must think beyond FHIR for a complete picture." — *HealthIT Analytics, 2023*

The reality is that healthcare organizations making critical decisions based solely on FHIR-accessible data are working with an incomplete picture. This partial view can lead to missed care opportunities, incomplete quality measures, and an inability to fully leverage advanced analytics capabilities that depend on comprehensive datasets. As the industry moves toward value-based care models that require holistic understanding of patient journeys, these gaps become increasingly problematic.

A Better Path: Open Standard-Based Data Extraction

An open standard approach to healthcare data management fundamentally changes what's possible with EHR information. Rather than being limited by the constraints of any single standard like FHIR or HL7, this approach embraces vendor-neutral tools and standardized data pipelines designed to extract and normalize **all** EHR data—regardless of whether it's structured or unstructured, standard or custom. This comprehensive methodology creates a foundation for truly data-driven healthcare operations.

By implementing an open standard-based extraction strategy, healthcare organizations gain several critical capabilities that conventional approaches simply cannot deliver:



Full-spectrum data access

Retrieve and integrate data across EHRs, legacy systems, and third-party applications without being limited by vendor-specific constraints or API limitations.

High-fidelity analytics

Generate clinical and operational insights based on complete datasets rather than just the portion accessible through standard interfaces.

Improved compliance

Enhance regulatory reporting with comprehensive auditability across all data sources and types, including previously inaccessible information.

Advanced AI capabilities

Provide AI/ML and population health tools with the complete datasets they need to deliver accurate, actionable insights.

Enabling technologies like natural language processing (NLP), health data lakes, and clinical archival platforms work together to extract and enrich data that FHIR alone cannot access. These technologies can parse physician notes, interpret custom fields, and standardize information from legacy systems to create a unified view of all available healthcare data.

In a case study from the Office of the National Coordinator for Health IT (ONC), a large health system was able to identify 25% more relevant patient insights by combining NLP with structured data extraction, revealing critical information hidden in notes and custom fields.

This substantial improvement in insight generation demonstrates the tangible benefits of moving beyond standard-only approaches to embrace comprehensive data extraction methodologies that leave no valuable information untapped.

The Call to Action: Partner with an Interoperability-First Vendor

As healthcare organizations navigate the complex landscape of digital transformation, selecting the right technology partners becomes increasingly crucial. Not all vendors approach interoperability with the same commitment to comprehensive data access. To truly unlock the full potential of healthcare data, organizations should prioritize vendors that demonstrate specific capabilities and approaches that go beyond basic standard compliance.

Essential Vendor Capabilities



The right vendor partnership can dramatically accelerate your organization's data strategy implementation and provide access to previously untapped insights.



Universal Data Ingestion

Support for data ingestion from all EHR systems, not just those that are FHIR-compliant, including legacy and custom platforms



Advanced Parsing Capabilities

Ability to parse and standardize custom fields and extract meaningful information from unstructured clinical notes



Modern Architecture

Cloud-native, secure, and scalable data solutions designed for healthcare's unique compliance requirements



Open Framework Philosophy

Commitment to open APIs and interoperable frameworks that prevent future vendor lock-in

By selecting vendors that embrace these interoperability-first principles, healthcare organizations position themselves to achieve several strategic advantages in today's data-intensive healthcare environment:

Benefit	Impact
Rapid insights from comprehensive data	Faster decision-making based on complete rather than partial information, incorporating both real-time and historical data
Simplified regulatory compliance	Streamlined processes for meeting reporting mandates across quality initiatives, government programs, and payer requirements
Enhanced data governance	Stronger control over data lineage, quality, and utilization throughout the organization
Future-ready infrastructure	Capability to adapt to emerging standards and requirements without major system overhauls

"You can't drive innovation without access to the full dataset. Partnering with a vendor that understands how to extract and normalize the complete EHR is no longer optional—it's strategic." — *HIMSS, 2024*

This strategic perspective recognizes that in today's healthcare landscape, data accessibility isn't merely a technical consideration—it's a fundamental business imperative that directly impacts clinical outcomes, operational efficiency, and organizational agility in responding to industry changes.

Conclusion

FHIR and HL7 have undoubtedly advanced healthcare interoperability, creating standardized pathways for data exchange that were previously impossible. They represent important building blocks in the healthcare data ecosystem and have enabled significant progress toward more connected care delivery. However, as this document has illustrated, these standards alone cannot provide the complete view of EHR data that modern healthcare organizations require to fully optimize patient care and operational performance.

A comprehensive healthcare data strategy demands a broader, open standard-based approach that accounts for the full complexity and variability of information across the care continuum. This means implementing solutions capable of accessing, normalizing, and analyzing data regardless of where it resides—in standard FHIR resources, custom EHR fields, unstructured clinical notes, or legacy systems.

As healthcare organizations continue their digital transformation journeys and increasingly invest in analytics, artificial intelligence, and machine learning technologies, ensuring access to all relevant data becomes not just beneficial but essential. The success of these advanced technologies directly correlates with the completeness and quality of the data they can access—making a beyond-FHIR strategy critical for organizations with ambitious goals.

The path forward is clear: healthcare leaders must prioritize partnerships with technology vendors who understand how to overcome the limitations of standard-only approaches and can deliver truly comprehensive data extraction, normalization, and analysis capabilities. By embracing this expanded vision of healthcare interoperability, organizations position themselves to:

- Reveal previously hidden clinical insights that can improve patient outcomes
- Enhance operational efficiency through complete rather than partial performance metrics
- Support more accurate quality reporting and regulatory compliance
- Future-proof their data infrastructure against evolving standards and requirements
- Maximize the return on investment for analytics and AI initiatives

Connect with a vendor who can take you beyond FHIR, and unlock the complete value of your EHR data to drive meaningful improvements in care delivery and organizational performance.

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