



# FROM CONNECTIVITY TO REAL PROVIDER USABILITY

Enhanced Reconciliation for Healthcare Data

# INTRODUCTION

Healthcare users are best served when their information needs are met. Invariably, those needs include access to data from outside the organization itself. Combining local and outside data for users is the best way to ensure they have access to a comprehensive up-to-date patient record.

Clinicians will make more informed decisions if they have access to information from other organizations and parts of the healthcare system. No healthcare organization (HCO) has all relevant data about a patient within its own electronic health records (EHRs) and other applications. They must rely on organizations across

their connected community to assemble a complete complement of high-quality deduplicated patient data. HCOs also need to be well positioned to take advantage of new and evolving data classes by integrating them into the patient's chart over time.

This white paper describes an approach to enhanced data curation (de-duplication and reconciliation) that will support the integration of any outside data sources and data classes into a patient's chart. It meets the organization's need for more satisfied, efficient clinical users by satisfying clinician's need for complete information and simplified workflows.

## KEY TAKEAWAYS

- 1** HCOs need an efficient and controlled way to deduplicate and integrate new outside data into the patient record.
- 2** Enhanced reconciliation reduces clinician burden and preserves the ability to exercise professional judgment. It increases patient satisfaction because clinicians are informed and up to date about their care needs.
- 3** Better usability improves clinical and financial outcomes and enhances the organization's return on its EHR investment.

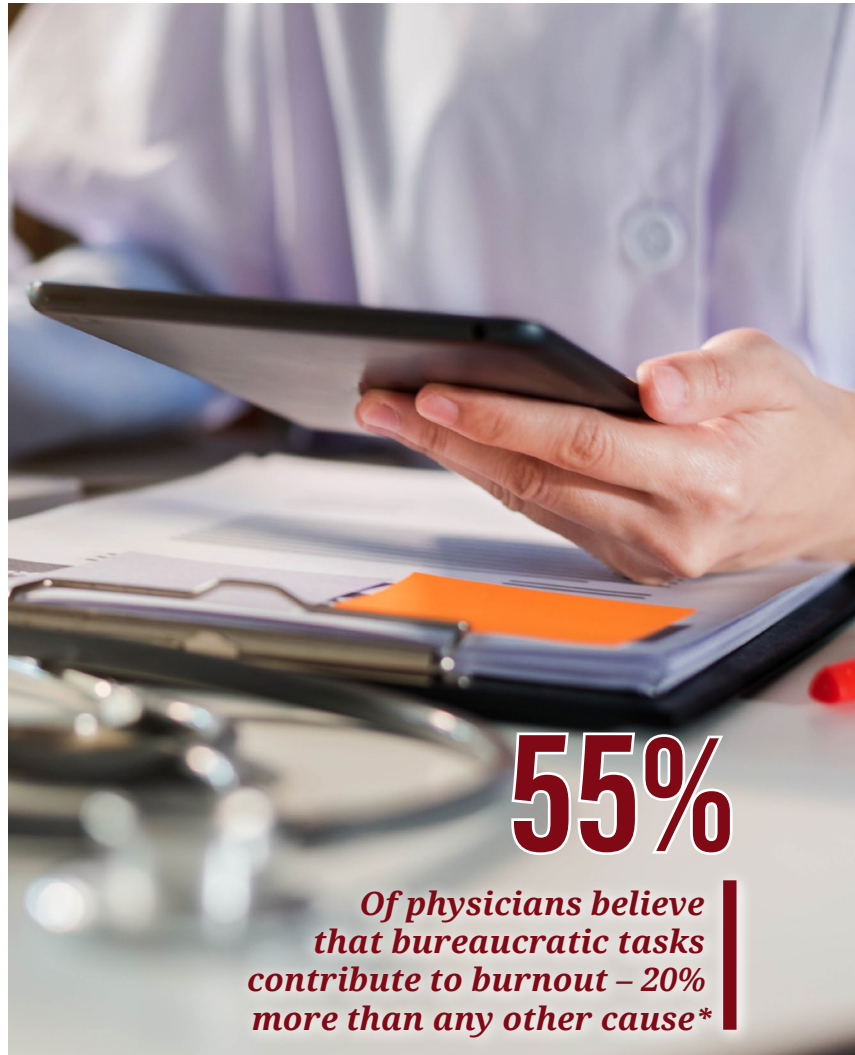


# STREAMLINED RECONCILIATION WORKFLOWS FOR CLINICAL END-USERS

Clinical end-users strive to efficiently reach a data-driven, system enabled understanding of their patient's medical needs to support decisions about their treatment and care. Clinicians recognize that patient data from outside their organization can contribute to this understanding. Some are hesitant to embrace the use of outside data because it can be confusing to use, difficult to access, and challenging to trust. When outside data is available, it is often a static display, usually embedded in a larger document or in a separate application or tab. Users often receive outside data in PDFs. This compels them to spend too much time poring through large volumes of not very well organized, duplicate, and non-relevant data to find what they need. Recognizing the difference between new, updated, and already known data can be challenging. Resolving duplicates and integrating new data into the patient chart can be done at an organization level, or by individual users.

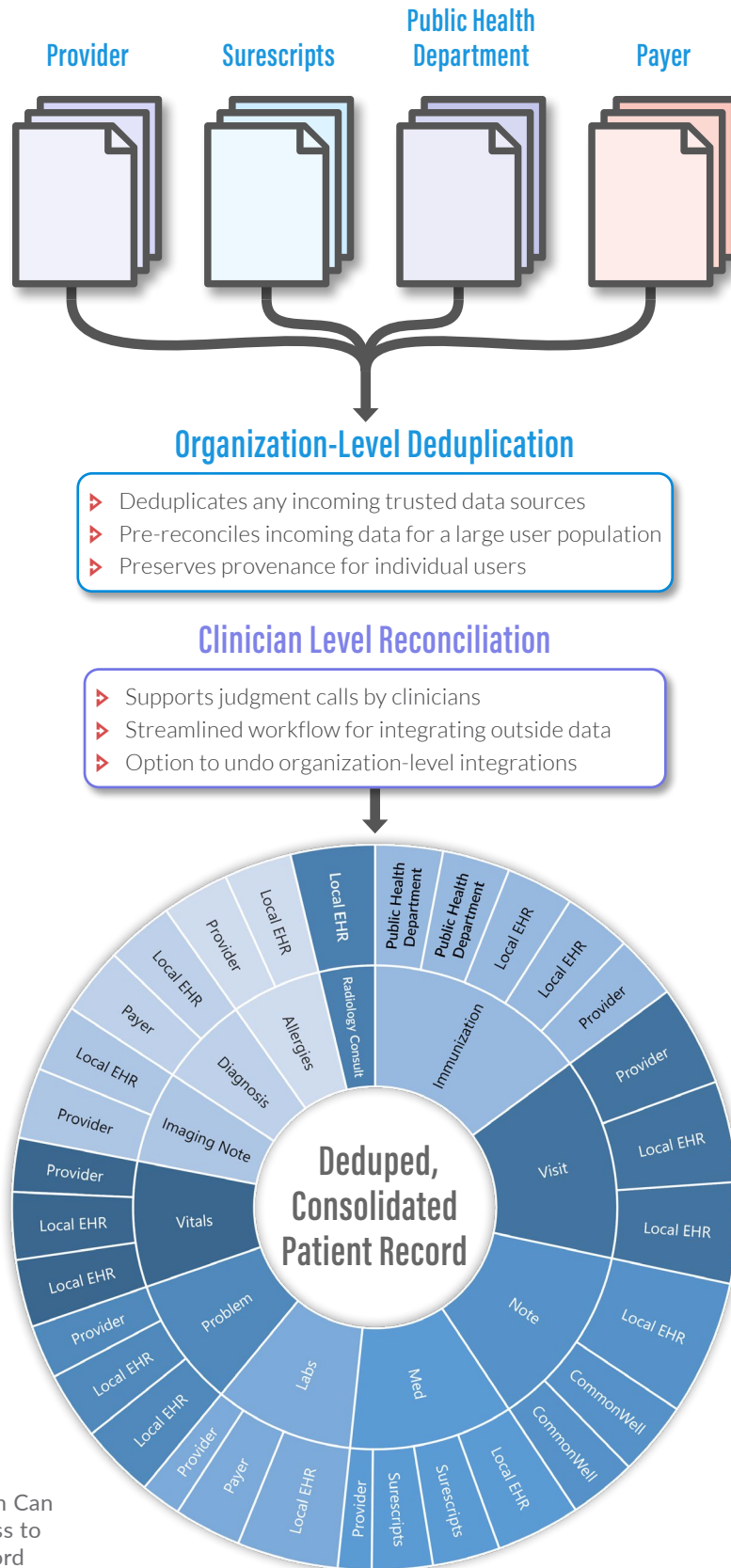
The following examples illustrate how challenging it can be for clinical users to sort through the data that exists in their EHR, and data received from outside sources:

- ▶ Some results from outside labs may already be present in the patient's chart. On the other hand, lab results from another provider delivered in document form may not. The user or the organization would then need to reconcile these new results into the patient record.
- ▶ Documents with information about a patient's medications could be received from multiple sources: the payer and its associated pharmacy benefits manager (PBM), from Surescripts, or from a regional or state-level health information exchange (HIE). Some of this information may already be present in the chart, requiring a rigorous deduplication. Some of the information may not be present in the chart and will require a reconciliation process by the organization or by the user.



- ▶ An ambulatory clinic may have transmitted a clinical document architecture (CDA)-based clinical summary to a hospital. The data in this CDA may contain new data and data already present in the hospital's EHR, requiring both deduplication (at an organizational level) and possibly reconciliation (by the user).

\*Source: Medscape National Physician Burnout & Suicide Report 2020: The Generational Divide; January 15, 2020



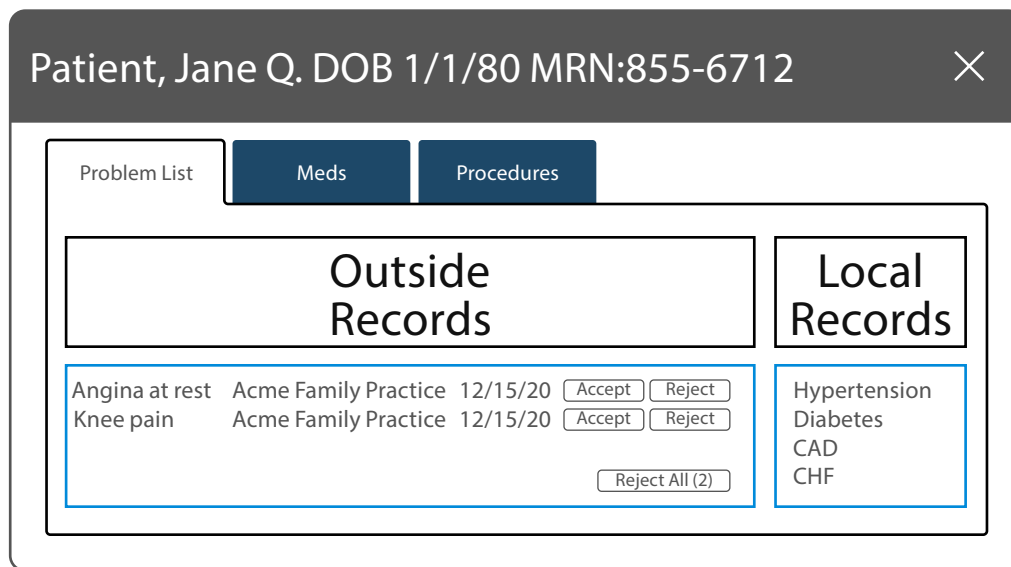
**Figure 1.**  
Any Outside Organization Can Contribute Any Data Class to the Blended Patient Record

Conventionally, and when reconciliation is an option, outside data is reconciled by the clinical user. Meds reconciliation is a well-known example. An HCO can go one step further than user-executed reconciliation and eliminate this workflow entirely for some outside source organizations and data classes. It could designate some outside organizations and/or some of their data classes as trusted and automatically integrate incoming data (see discussion below on trusted sources). In that case users should be made aware that some data items from some sources have been pre-reconciled for them by their organization. The real advantage to users of this automatic reconciliation capability is that it can save them from the time-intensive process of reviewing and approving/rejecting incoming data from outside sources.

Clinical end-users prefer navigating to a single place to find outside data from around a connected community – namely their familiar EHR workflow. Clean, deduplicated, and standardized outside data that is fully integrated into their local EHR data will ensure that clinicians can efficiently make sense of all relevant data about their patients.

Workflows for managing data from other organizations may vary significantly according to the data class being reconciled. Each data class has idiosyncrasies. Some need to be presented on a timeline or grouped to provide the full picture. While different data classes will necessarily require some flexibility in the workflow approach, it is important that the review and incorporation workflow have some common design elements to build user acceptance and confidence.

The workflow should be streamlined and efficient. Users will need the option to accept or reject incoming outside data, either on an item-by-item basis or in bulk. Figure 2 provides a simplified depiction of how outside and local information can be presented side-by-side to a user. This illustration of a reconciliation workflow shows how a user can quickly evaluate whether new outside data should be added to the chart. Once a data item is accepted by the user, it is incorporated into the patient's local longitudinal record. Users would also value the ability to selectively revoke acceptance of outside data from the patient's chart.



**Figure 2.**  
Simplified Example of a Problem List Reconciliation Workflow

### The User Perspective: Reconciling Data from Outside Organizations

Well-designed workflows that enable efficient inclusion of outside data will be a critical element in gaining user acceptance. The idea is simple. Provide a single consistent workflow so users can see, review, and incorporate externally created data into their EHR.

### The Importance of Provenance to Users

Provenance is important for several reasons. Users want to know where the data they are looking at came from and be comfortable with any pre-reconciliations that occurred before their review. To preserve the autonomy and judgment of individual clinicians, they will need a simple way to distinguish between what is local to their organization and data that originated outside and where it originated. The

mere presence of data from some outside sources may tell a clinician something about the patient's journey or course of illness that may not be obvious from the data in the local EHR. For example, medications administered recently at a post-acute facility signal a relatively recent hospital discharge. Data from some outside organizations may instill confidence from some clinicians who know about the outside organization's policies or clinical procedures. In addition, many clinicians may practice or be credentialed in some of those outside organizations.

Clinicians may have reservations about relying on data from organizations that they either do not know or have reason to question. In these cases, the organization can get insight into parts of its referral network that could work more effectively with its clinicians. The organization can then play a role in resolving the concerns of its clinicians by working with the outside organization to reduce noise in the data that may be preventing its clinicians from trusting data from that outside organization.

### **Users Want Complete Data**

In addition to data provenance, users need to trust that their data gives them a comprehensive view of their patient's health needs. Most would prefer not to have to read or search through a voluminous record with data collected over many months or years. Providing them with recent data as soon as possible in the workflow will give them confidence that the data they are looking at is complete and up to date. Frequently, and in many clinical contexts, outside data can provide some additional historical depth to the patient's chart in a way that may not be available using local data alone.

### **Dealing with Data in Documents**

Users often receive data from outside organizations in document form. Whether as a CDA, a PDF, or a text document, outside data is generally presented to them separately, distinct from the rest of the data in their EHR. They may get this data in a messaging application or as an attachment to a message in their EHR inbox. They may need to use a document management application that indexes documents individually, with no integration or consolidation across the different documents. While many clinicians are familiar with such large documents from outside organizations, they are also unfortunately familiar with the time-consuming task of reviewing the document(s) to find relevant information. Most will express a strong preference to have these documents parsed so that for relevant data is extracted and available in a reconciliation workflow so they can incorporate the data into the patient's chart. They will say that such parsing and incorporation delivers

a less burdensome workflow for clinicians looking for a streamlined way to review, understand, and digest document-based outside data.

### **Specialized Data and Unfamiliar Organizational Sources**

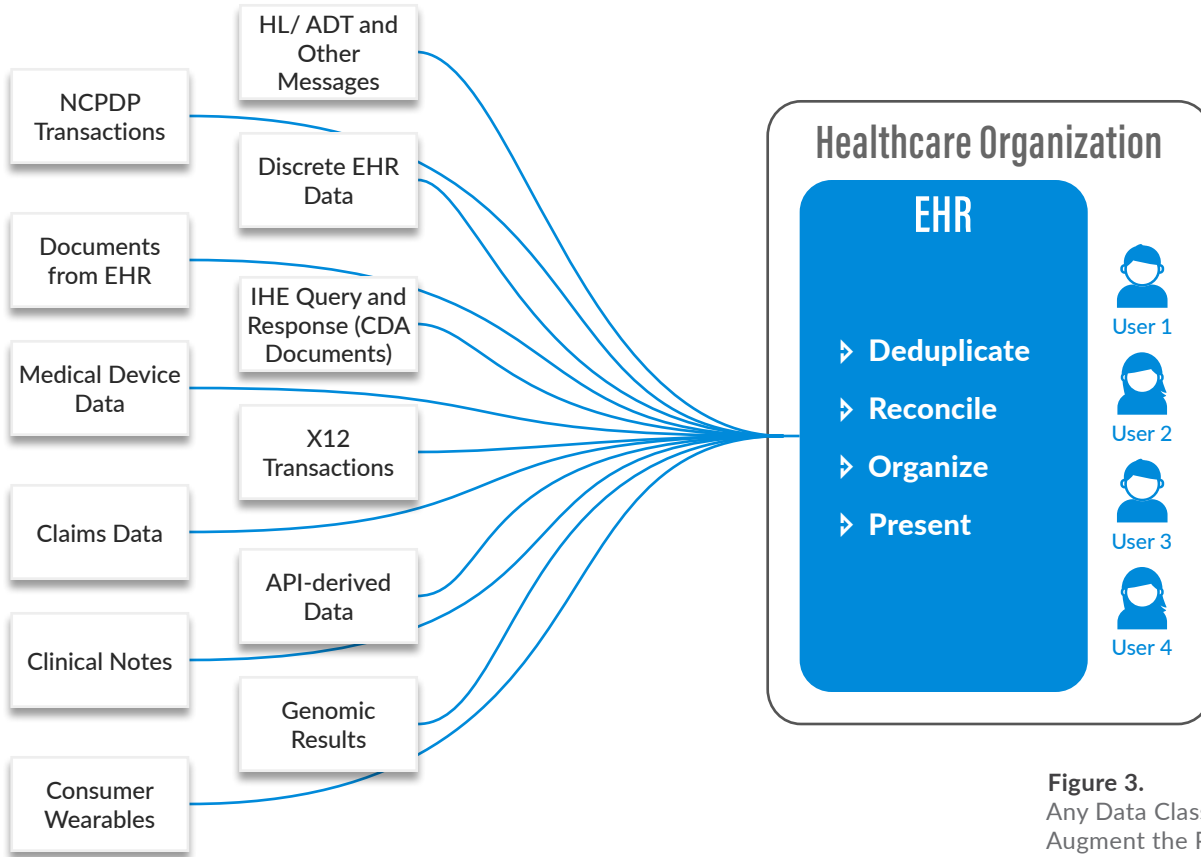
Most clinical users rely on a set of familiar clinical data classes (problems, allergies, medications, results, vitals, etc.) to make decisions. Over time, they will want to take full advantage of specialized data classes and new organizational sources. Clinicians are already beginning to see that social determinants of health (SDoH) and genomics-related data is available. While clinicians may not routinely use such data currently, they will increasingly need such data blended with their existing data.

The availability and variety of SDoH data is expanding rapidly. Almost by definition, such data usually originates outside of the healthcare organization. This data will be highly varied in its sources, formatting, and expressions. It will originate in organizations not typically associated with healthcare such as credit agencies, large consumer-facing organizations, and small community organizations. Some of it will be document-based while some may be delivered in discrete, structured forms. Regardless of the format and expression, clinical users will want some of this data incorporated into the patient record they use to deliver care.

Clinicians want to tailor medical treatment to the individual characteristics of the patient. Genomic data science is enabling researchers to use powerful computational and statistical methods to decode the functional information hidden in DNA sequences. Genomics research is expected to generate between 2 and 40 exabytes of data over the next decade. This data, and data derived from it, will have many potential uses in healthcare. This data class will be not only be more common, but likely to originate in far-flung parts of the healthcare system. Clinicians will expect it to be present in the patient's chart if it exists.

### **Clinical Decision Support**

Clinical decision support (CDS) is an important safety feature in all EHRs. In the normal course of events, CDS alerts fire when data is added to the patient's chart. Ideally, when outside data is accepted into a patient's chart, any relevant CDS alerts should fire as well. An organization's catalog of CDS rules should have access to the combined store of local and outside data. For example, new data could be used to detect quality or coding gaps in a value-based care program. The alert could then present the user with the opportunity to address those gaps.



**Figure 3.**  
Any Data Class Can  
Augment the Patient's Chart

### The Organizational Perspective – Reconciling Data from Outside Organizations

Organizations want their users to fully utilize all relevant data that exists in their connected communities. At the same time, they have no desire to compound the problem of clinician burden by overwhelming users with too much data, or too much process for adding outside data. To realize the full potential of outside data in an enterprise EHR, the organization will need to develop consistent data quality standards and IT practices for managing incoming data from outside organizations.

#### Trusted Sources and Data Classes

Given the large number and growing variety of organizations that can contribute to the patient's longitudinal patient record, HCOs will have to select and work with outside organizations best able to provide valuable data for their users. An HCO should consider which outside organizations can reliably deliver high quality data suitable for inclusion in the patient's chart, eliminating the need for a clinician to reconcile that data. For each such trusted organizational source, an HCO can also evaluate which data classes (e.g., problems,

allergies, medications, procedures, lab results, etc.) are eligible for automatic inclusion. In short, HCOs will want to make decisions about trusted sources of patient data for the purposes of auto-reconciliation.

Determining which organizations qualify as trusted data sources can be a complex question for any HCO. The introduction of outside data will have different implications for different parts of an HCO. Since these new data sources can become part of the patient's legal health record, compliance, health information management (HIM), and law departments will want to contribute to the process and have some oversight on an ongoing basis. Different clinical departments will also want to contribute ideas about data classes and organizational contributors. In some cases, the outside organizations themselves will also want to understand the process and who else is contributing. The IT organization and/or EHR vendor will also want to participate and contribute ideas about establishing data quality standards for outside contributors. The bottom line is that an HCO will need to build a process or program that meets the needs of multiple constituencies across the HCO and its connected community.

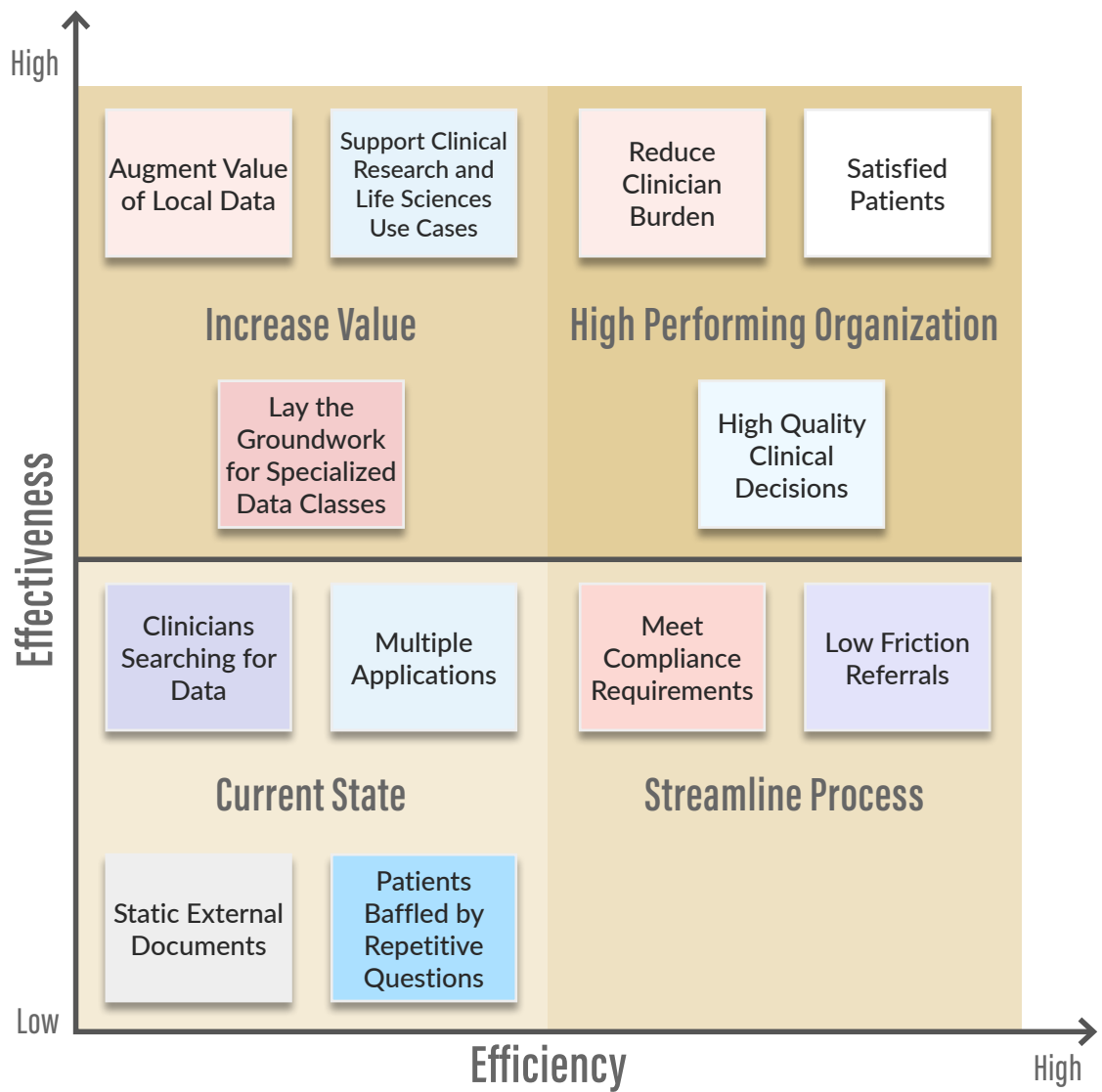
**Leverage Data from Existing Networks**

The ability to get data from national level networks-of-networks and HIEs will further ensure that patient data is truly comprehensive. These networks all have a fast-growing list of participants from around the healthcare system. In addition, many can provide relevant data about individuals that may not be found in provider or payer applications. Networks such as CommonWell, Carequality, the DoD-VA Joint HIE, eHealth Exchange, different Direct-based networks, as well as the eventual network established under the Trusted Exchange Framework and Common Agreement (TEFCA), have, or will have a wealth of potentially valuable data.

State-sponsored immunization registries are also important sources of data for EHR users. The COVID-19 pandemic underscored the critical need to have immunization data readily available to EHR users. Many organizations will want to give their users access to such data by incorporating it into the patient’s chart.

**Summary of Benefits of Enhanced Reconciliation**

HCOs and their end-users will see a range of benefits from adopting a comprehensive and ordered approach to incorporating outside data in their EHR. These benefits will build on each other and make the organization more efficient and effective.



**Figure 4.** Benefits of Managed Incorporation of Outside Data



### Increasing Efficiency and Effectiveness

The inclusion of outside data addresses many shortcomings of an organization-centric view of patient data. Users can avoid having to search through multiple applications and/or documents to find relevant data. Patients will be reassured when clinicians seem up to date on their current situation and care needs.

Successful referrals depend on comprehensive data, especially data from the referring provider or organization. An HCO could identify high-volume or high value referring organizations and providers and then establish them as trusted data sources. This will enable the HCO to be more responsive to both the patient and the referring provider, helping to guarantee a smooth flow of referrals.

In addition to making clinicians day-to-day activities more efficient, the reconciliation workflow described here helps satisfy compliance requirements. For example, these workflows meet some of the Promoting Interoperability measures in the Merit-based Incentive Payment System (MIPS) program. Since all the data mentioned so far is PHI and subject to HIPAA's privacy and security requirements, the rigorous methods of including outside data described will help to ensure HIPAA compliance and any obligations under Business Associate Agreements (BAA).

Data in documents with significant actual value to clinicians often goes unused simply because it is too difficult or too time consuming to find. This data can make internally created data more valuable to the organization. While a patient-centric view is already possible for some data classes (e.g., lab results), incorporating data found in documents gives a more comprehensive view of the longitudinal patient record. Blending this data with the local EHR sheds new light on the data already present in the chart.

Outside data will also fuel new applications or new features in existing applications by adding value to data warehouses or claims records to. For example, value-based care (VBC) programs require data that is broader than any one organization collects or has. The multi-organization blended patient record described here can serve as the cornerstone of better workflow automation in clinical VBC programs. Life sciences organizations and clinical research constituents also have a strong and long-standing interest in using comprehensive data about patients.

The capabilities described here can be readily adapted to new and emerging data classes. Data not currently in wide use, such as genomics or consumer sources can set up an organization to collaborate more effectively its wider healthcare

ecosystem. A new class of digital health applications will also begin to create more patient-related data for a multitude of purposes and use cases. This data, much of it still to be defined, will take its place alongside existing data classes in the longitudinal record.

### High-Performing Organization

When clinicians have straightforward workflows for incorporating outside data sources into the EHR, they will spend less time in their EHR documenting and more quality time making clinical decisions. The concept of trusted organizational sources whose data can be automatically reconciled and blended into the patient's chart means that clinicians do not have to perform record reconciliations. With more efficient processes and workflows, clinicians can spend less time making better decisions.

A general-purpose reconciliation capability is also an important enabler of an HCO's growth and expansion strategy. Acquired practices or organizations (with the same or different EHRs) could be treated as a trusted data source. CDAs generated by their EHRs could be imported and reconciled to the HCO's EHR. In this way, an HCO can help expedite data migrations from the EHR's of acquired practices and organizations. Alternatively, the ability to combine data on demand would permit acquired organizations to keep their existing EHRs rather than having to go through a complex and potentially disruptive platform consolidation.

When an HCO's EHR reflects activities from across its connected community, its clinicians will know more about each patient they diagnose and treat. Clinicians will be able to make decisions confident that they are up to date. As a result, clinicians gain additional patient insights beyond what their organization can provide from their own records of the patient. Patients will notice that clinicians are more informed about their recent encounters and overall health. The net effect can be more effective encounters that translate into a better care experience for patients. This will translate into higher patient satisfaction scores.

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# CONCLUSION

Enhanced reconciliation of healthcare data will deliver significant benefits to clinicians, patients, and to HCOs. Clinicians prefer using their familiar EHR workflow to find data from around a connected community. Normalized, deduplicated, and standardized outside data that is fully integrated with their local EHR data will ensure that clinicians can efficiently find and make sense of all relevant data about each patient. In addition to providing a basis for better clinician decisions, enhanced reconciliation will make clinician's jobs less burdensome while preserving their ability to exercise professional judgment.

Patients will benefit when clinicians have access to all data on recent clinical events and observations. It will help eliminate the repetitive questioning across different clinicians and venues that erodes trust in the care experience. Patient trust will be reinforced when clinicians demonstrate that they understand why the patient is seeking care and what led them to the current encounter. Patient satisfaction will increase and be reflected in quality scores – increasingly important for financial success in consumer-centric healthcare.

Enhanced reconciliation will deliver a higher return on an HCO's EHR investment. As they face a future characterized by ever-changing payment rules, evolving care models, more patient choice, more competition from existing providers, and the possibility of new entrants, HCOs will need to marshal all the data available to them. Enhanced reconciliation will help an organization to adapt its workflows, enhance its applications portfolio, and exploit new and different kinds of data to thrive in the pursuit of healthcare innovation.



## About the Author



### **BRIAN MURPHY - REPORT AUTHOR**

#### **Director of Research**

Brian Murphy joined Chilmark Research as an industry analyst in August 2012 and brings a wealth of experience to the table. He is an outspoken advocate for true interoperability being the key to unlocking the potential of health IT and has centered the majority of his research efforts with Chilmark around this subject. He also currently heads research for the Analytics domain.

Brian has worked in the IT business for over 25 years, beginning his career in the field-sales organization of IBM. He then joined Yankee Group as an analyst, where he managed an enterprise software service and led research on the dynamics of the database market. Leaving Yankee, Brian joined Eclipsys prior to its acquisition by Allscripts in 2010. At Eclipsys, Brian worked with product managers to refine and harmonize value propositions in light of the organization's broader goals.

Brian is a graduate of both Harvard College and Suffolk Law School. When not thinking about health IT, he's a runner and armchair Boston historian.

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