TRANS[IT]ION

TACKLING TRANSITION

Clinical Data Conversion Considerations in a World of Value-Based Care

By Galen Healthcare

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EXECUTIVE SUMMARY

With the increase in mergers and acquisitions within the U.S. healthcare market, the demand for conversions from one system to another has grown exponentially. According to a 2014 KLAS study, almost 50% of large hospitals plan to replace their EHR by 2016. In fact, according to the 2015 EHR BuyerView survey from Software Advice, the number of buyers replacing their existing EHR system has increased nearly 60% year over year – so this trend is far more than a blip on the healthcare IT radar.

Of course, when these practices and physicians are brought into the fold, their patient data needs to come with them. A common misconception (or at least, a common hope) is that EHR data conversions can be done with the flip of a switch. Unfortunately, given the reality of a marketplace full of disparate systems with many customizations, this is never the case.

Organizations must plan thoughtfully and implement their conversion process carefully, for if not done correctly, data conversion projects can result in serious unintended outcomes. Namely, healthcare providers can be left without the information needed to make the best patient care decisions, and organizations may not have easy access to the historical data necessary for participating in Meaningful Use and other current and emerging value-based care reimbursement methodologies.

No matter which EHR the organization is moving from or towards, legacy patient data must be presented in the new EHR in a way that is meaningful to physicians and clinical staff, and stored in a way that provides the healthcare organization with the flexibility to analyze aggregate historical patient data. There are several methods for achieving these goals, which must be carefully considered at the beginning of your conversion journey.

This whitepaper aims to help you successfully tackle the transition by providing a look at common scenarios we've encountered in over a decade of providing clinical data conversions. At Galen Healthcare, we've performed over 180 conversion projects, handling more than 2.3 million

patient records for our clients. Although we would never say we've seen "everything" when it comes to conversions, we believe our experience can help you with your own EHR conversion. In this whitepaper, you'll find best practice advice for planning and implementing the technical and functional aspects of a conversion project; our perspective on the growing importance of data liquidity; and several real-life case studies that will help you master the data universe and convert with confidence.

WHAT MAKES CONVERSIONS SO CHALLENGING?

The process of converting from one EHR to another is among the most difficult technical and functional projects a healthcare organization can tackle. It requires a thorough understanding of the underlying data structure as well as a solid foundation in interoperability standards such as LOINC, HL7, SNOMED, and CDA. Beyond the technical considerations, bringing together all of the stakeholders in your practice or practices and getting them to agree on which data will be migrated can be a significant challenge. If the right questions are not asked at the start of a conversion project, it may be executed in a way that does not meet the needs of all stakeholders – resulting in time-consuming and often expensive rework or project cost overruns.

Common challenges posed by a clinical data conversion include:

- Often, a large amount of data is being added to the target system, and it is very difficult to change once the data has been loaded – so it needs to be carefully planned and done right the first time

- The way the data is stored in the source system does not always "play nice" with the way data is accepted by the target system

  - For example, the way the source system records medication refills may be different from how the target system records them

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- Organizations often need to think long term and about the larger impact of each decision

    - For example, mapping a highly-utilized medication in the source system to a rarely-used medication in the target system may not be a good idea

The sheer number of decisions to make can be overwhelming! If you are at the beginning of this process, you may have encountered trepidation within your organization surrounding the successful transfer of valuable data in your legacy system(s) to the new system. The most important factor in this process is preparation. Poorly-executed conversions occur when organizations underestimate the time it will take to prepare. The conversion process itself is often quite quick, but it has to be well thought-out in order to succeed. Your project team and/or vendor must take the time to ask many questions at the beginning, and think carefully about the impact of each answer.

With that in mind, here are a few critical questions to ask at the start of your conversion:

- Will drug interaction checking continue to occur with the legacy data?

- Will allergy reminders continue for legacy EHR patient allergies?

- Will it take more clicks to get to the legacy data?

- Will the doctors be able to easily access their legacy EHR data quickly and easily to find the data needed to make a clinical decision?

If you are converting paper records to a new EHR, this last question is especially important. The volume of scanned images and documents that need to stay with each patient record can be enormous, and loading these data points into an EHR in an easily-accessible way is a time-consuming effort. For compliance reasons alone, this data archival is necessary, but ask yourself: Would care be improved by allowing physicians to access a patient's complete medical history during any visit? The answer is often yes, and so you must consider how these documents should be stored and what aspects of their contents can be searchable from within the new EHR.

DATA LIQUIDITY: WHY IT MATTERS MORE THAN EVER

Until quite recently, clinical data conversions were often looked as a step that was required by law (in many states) and necessary in the short term when a practice was acquired or an independent physician joined an organization. However, these projects were not seen as a critical aspect of the population health strategy for a healthcare organization.

It was considered "adequate" for data to be converted from the legacy EHR in a non-discrete format, often to .PDF chart summaries which were manually referenced as patients came in. Under this model, patient charts are slowly built up again in the new EHR, with only limited access to historical data. Indeed, a historical analysis of all conversion projects performed by Galen Healthcare over the past decade shows that 66% have been non-discrete conversions.

However, with the advent of Meaningful Use and Accountable Care, the approach to EHR conversions is shifting rapidly. The liquidity of patient data – that is, its' ability to be exported to other systems as needed, then aggregated and analyzed – has grown exponentially in strategic importance. Without a full, easily-modeled picture of the patient population and their care history, senior executives are limited in their ability to analyze different possible reimbursement strategies, and their access to complete reporting for patient care improvement initiatives is severely curtailed. When discrete data is carefully mapped from paper records or a legacy EHR to the target system, this modeling becomes possible.

Most of today's value-based incentives — and penalties — rely on quality measures. For many years, providers have submitted quality measures for programs such as Hospital Inpatient Quality Reporting (IQR), Hospital Outpatient

Quality Reporting (OQR), and Physician Quality Reporting System (PQRS). The fact that these measures are now tied to penalties and incentives is new. These new value-based models require providers to prove that they're meeting quality standards and benefitting patients while cutting costs.

Providers need sophisticated analytics to help them measure financial and quality performance for each population of patients. They don't want to learn that their reimbursement is going to be poor after it's too late to do anything about it. Rather, they want to know in the first quarter so they can improve their performance before the end of the year rolls around.

To do this, they need to be able to measure performance on a continuous basis, and that means that a complete set of patient data must be available, regardless of whether the system has just acquired a practice or provider. It's one thing to handle this level of performance analysis for a single patient population or a single quality measure. It's another story altogether when you consider how quickly the number of measures a health system must track is multiplying.

For all of these reasons, it is our strong belief that organizations must move in the direction of performing discrete data conversions. While these projects may take somewhat longer initially, the payoff is huge. Non-discrete conversions may still have their place, but discrete conversions are the future.

FUNCTIONAL AND TECHNICAL CONSIDERATIONS

Which Data Types Should We Convert?

The most important functional decision for your conversion project is deciding which data types will be converted. Data types in your current EHR may include:

- Immunizations

- Allergies

- Medications

- Results

- Problems

- Documents

- Vitals

- Images

However, not every data type may be present in the source system, and not all fields may be able to convert. Discuss how you will handle these as soon as they are uncovered! In addition, if your organization does not have an inbound results interface, there may not be results to extract and another method may be required.

The key takeaway is that you must clearly define what fields will be converted and determine where each field will render in the target system. Once the project has been fully scoped, this should be the first step you undertake with your vendor and internal team.

PRO TIP: Annotations

- Using annotations is an easy way to signify that clinical data came from another system

- Use annotations to add data that is not able to be mapped or able to be brought over discretely

- Use annotations to capture free text comments from the source system

How Do We Handle Medications?

A common area of confusion is how to handle current medication and medication history. To plan your approach, it's critical that you understand how your current system handles medications. If your system is set up so that the "current medications" field only shows the most recent *occurrence* of a particular medication, not necessarily the

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last time it was prescribed, this data may not map correctly into the target system.

When it comes to Medication History, your organization should discuss how important it is to maintain a record of every time a medication refill was recorded. In a conversion, each time the medication was recorded will convert separately, which can clog up the Past Medications section of each patient's record.

Another key functional area of your conversion is how providers are handled. Given our experience, our best practice recommendation is to:

- Map all providers
  - This will allow you to associate providers with medications prescribed, orders placed etc.
  - Be aware that mapping will not always connect the provider to the most recent record
- When converting data from an acquired practice, use a generic "conversion" provider
  - This allows users to see where the item came from at a glance
  - For example, the provider "name" could be 'Conversion MD, HeartPro'
- Map data for non-providers
  - Allows you to retain key information such as 'Administered by' and 'Recorded by'
  - Another option is to use annotations to note this information in the record

What Should My Validation Plan Look Like?

Your functional plan must also include validation. The options for a validation plan include:

Unit testing

- Test a few examples of each data type

Small Scale

- File data for a small number of patients

Large Scale

- Convert data for a large number of patients
- Validate build and mapping

Full Scale

- Convert the entire data set to the target system

Types of Conversions

From a technical standpoint, the first and most important decision you will make in your conversion process is deciding whether to perform a non-discrete or discrete conversion. What many organizations don't consider at the start of their project is that within these broad categories, there are a variety of "flavors". Put very simply, here are the primary differences between these options:

Non-Discrete Conversion	
Chart summary of data	• Less Work • Won't duplicate data • Not reportable
Discrete Conversion–Stored Procedures	
Inserting data directly into the database	• Reportable • Users can use items in workflow • More work • Can duplicate data if users are already live on system
CCD–Continuity of Care Document	
Active problems, medications, and allergies	
Semi-discrete	• Epic will attempt to match items on import • Users will need to manually reconcile the remaining items
Imported via separate utility (Document Assimilator)	
Other data can be viewed via a report	
Discrete Conversion–HL7 Messages	
Imported via Interface (Bridges for Epic)	• Reportable • Data is filed directly to the patient's chart • Needs to be mapped

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Patient Matching Considerations

There are several different options for matching patients when your data is converted, and it's important to consider the nuances of each at the start of your project. The primary decision is whether to use standard matching, or extended matching criteria. Standard matching may be sufficient, however it can become an issue with large numbers of patient records and matches can fail, which then results in significant manual effort.

Reasons that patient matching can fail include:

- A misspelled name

- Name change

- Info lacking in the legacy system

- Patients don't exist in the target system

Digging into and "cleaning up" patient demographics as you plan your conversion is critical to avoiding matching issues during the actual conversion.

Getting Access to the Data

Another technical aspect to consider early in your project is data access. There are three main options:

1. Direct network access

2. Access to the legacy system

   ○ Can be achieved using a tool such as Galen Securelink

3. Linked server

   ○ A copy of the legacy system is loaded to a test database in the target system

There are also a few options for handling scanned images that should be discussed and planned in advance, including:

- Direct network access

- A removable device (external drive, thumb drives, CDs)

- FTP

REAL-LIFE CONVERSION SCENARIOS

Bryan Health

Bryan Health is a not-for-profit healthcare organization headquartered in Lincoln, Nebraska. Currently boasting 26 locations and over 4,000 care providers, Bryan has become familiar with the challenges of EHR conversion during a recent period of rapid growth.

Early in 2015, Bryan acquired an OB/GYN practice with 10 physicians who had been using Allscripts Professional for seven years. Recognizing that they were required by state law to convert the OB/GYN practice's data to their Allscripts TouchWorks system, Bryan engaged Galen Healthcare to help them perform a discrete data conversion on eight years of data for approximately 4,000 patients.

Since the main point of contact at the OB/GYN practice was not familiar with Allscripts TouchWorks, the client relied on Galen's expertise with both the old and new systems. A careful scoping process uncovered the baseline criteria for the client, which included the migration of:

- Complete EHR data for ~4,000 patients

- Historical appointment data and comments in the notes section

- A list of patients who frequently "no-showed"

- Inactive data, which the client wanted to review in the future and delete / keep as needed

Working hand in hand with the client, Galen led them through the six stages of the Galen conversion methodology (see the last section of this whitepaper for

more information). A unique aspect of Bryan's project was that they went live with their Practice Management (PM) system conversion first, and then performed the EHR conversion four months later, so Galen set up their existing EHR to connect to the new PM system during that interval.

The key success factor in this conversion was that the client team made the project a top priority and committed early to a timeline, and then truly integrated their Galen project manager into their team. This allowed Galen to move quickly and bring the OB/GYN's data live less than four months after the project began.

In parallel with the OB/GYN conversion, Bryan Health engaged Galen to convert data for a single Internal Medicine physician coming into one of their practices. In this case, a physical copy of the provider's EHR data was given to Galen. Based on nuances learned in the previous project, the Galen team was able to quickly and smoothly load pertinent patient data into Bryan's Allscripts TouchWorks system and bring the provider live in under two months.

OrthoCarolina

OrthoCarolina is one of the nation's leading independent academic orthopedic practices serving North Carolina and the Southeast. With over 130 surgeons and over 25 locations, OrthoCarolina provides comprehensive musculoskeletal care including operative and non-operative care, diagnostic imaging, and rehabilitative therapy.

In 2014, OrthoCarolina acquired its Winston-Salem location that has been utilizing the NextGen EHR system

for many years. Prior to bringing the Winston-Salem location live on its enterprise EHR solution (Allscripts TouchWorks) the need was established to convert and migrate key data categories from NextGen to TouchWorks in order to continue facilitating a smooth transition into the existing clinical network and meet its ongoing retention requirements. Galen was called upon to partner with OrthoCarolina to help manage and execute this data conversion project.

Conversion Scope:

The scope of the conversion included converting scanned images and documents as non-discrete, and patient result history as discrete TouchWorks data. The breadth of the data included in the overall data conversion impacted 30 providers across three unique specialties, encompassed 12 years of historical data, and helped to bridge approximately 310,000 unique patient records. The GalenETL conversion platform was used to stage and execute the technical processes supporting the data conversion.

Conversion Statistics:

Data Type	Source Transactions	Successfully Converted	Processing Time (minutes)
Images/Scans	5,662,910	5,656,011	17,048
Documents (.DOC)	894,301	5,733	5,743
Documents (.RTF)	1,366,724	1,366,660	2,504
Documents (.HEDS)	817,360	817,344	1,527
Results	5,076	5,076	48

Tackling Transition

Non-Discrete Data Types:

The non-discrete portion of the data conversion involved two essential data categories which helped to compensate for the absence of executing a full discrete conversion, and provided historical reference to all clinical elements during the go-live event. Scanned images were converted and manifested to .PDF items, then imported into TouchWorks. The document element portion of the data conversion involved three different manifestations of source data that needed to be converted to .RTF TouchWorks item types prior to converting into TouchWorks. A key driver to maintain the target manifestation item type of .RTF into TouchWorks was the ability to be able to edit these documents in TouchWorks post conversion. Prior manipulation for .DOC source documents was required via a Microsoft Word plugin in order to stage the documents into .RTF format prior to import. Prior export and staging was required directly from the NextGen vendor in order to obtain a digestible .RTF format for these documents to be imported into TouchWorks.

Discrete Data Types:

The discrete portion of the data conversion included discrete lab result history from NextGen, specifically associated with an external reference lab that had previously been interfacing HL7 results inbound to NextGen during the legacy utilization period prior to the conversion. The data category was executed utilizing a full Order/Results item data mapping from NextGen to TouchWorks. What enabled this to occur without intensive translation efforts was the fact that the same reference lab HL7 integration was concurrently being built in the TouchWorks target system. This allowed direct Order and Result code matching to occur during the data transformation process, aligning this gap build with an already existing integration initiative, and eliminating the need to auto-file NextGen reference lab results. This process resulted in uninterrupted flowsheet integration and no additional dictionary cleanup post go-live.

TOP 5 FREQUENTLY-ASKED QUESTIONS

1: Do you convert all data from the legacy system, or can parameters be put in place?

A: We can convert all of the data or a selected range of the data based upon your requirements. Typically, the data elements & amount/duration of data is driven by organizational requirements related to continuity of care, patient safety and even population-based reporting requirements. The Galen team is able to assist your organization in evaluating these requirements and industry best practices regarding these considerations.

2: How long does a live conversion take?

A: All conversions are based on elements being converted and the amount of data to be converted. For example: if Medications, Allergies, Problems, and Scanned Documents are to be converted and there are 10 years worth of data, then the process could take up to a week to convert into live. It is recommended to do these types of conversions in stages and spread it over several weekends.

3: What about any new items that were added in the legacy system after the initial extract was taken? How do we include those items in the conversion?

A: There are a couple different ways this can be handled. It depends a bit on the exact source system you are converting from. If the source system allows free text items (medications, problems etc.) it can be helpful to instruct users to not enter free text after the initial extract and to only use dictionary items. Then to capture any data that was added, a second extract can be taken a week or so prior to the go live and a catch-up mapping exercise can be performed. This should capture any items that were added.

4: Why does the conversion only grab the most recent instance of each item?

A: Most EMR systems store each time a clinical item was updated separately. For example, if a diagnosis was assessed three different times during three separate visits, there would be three records of that diagnosis. If we were to convert each instance of that diagnosis, you can imagine we would end up with duplicates in the patient's chart. We typically extract the most recent example of the item so we get the most up-to-date comments/edits to that item.

5: What do we do when a patient is not able to be matched?

A: There are a few different options you have when patient matching fails. During the conversion process, we can provide a report of those patients that failed. The easiest method to correct the errors is to update the legacy system or TWEHR to fix the reason for the error. This might be updating the patient's last name or some other piece of information so it matches the other system. If patients are missing from the target system, they can also be added. If the patients do exist in both systems and the first method is not an option, a one-to-one mapping exercise can be completed that will map the patient in EEHR to the unmatched patient record from the legacy system. This mapping can then be added to the conversion logic so data is able to be converted. Another option is to manually abstract the information for those patients that cannot be mapped. This can be a preferred option if there aren't many patient matching errors or if the project is on a tight timeline.

ABOUT GALEN'S CONVERSION STRATEGY & METHODOLOGY

Tackling a clinical data conversion initiative can be overwhelming. Just knowing where to start can be difficult! To formulate their strategy and help execute it on time and on budget, many organizations work with a vendor.

Galen Healthcare, with our decades of experience and deep expertise, is a partner you can rely on to help you avoid the pitfalls of conversion and optimize your system. Galen provides leadership-level consultants to drive your EHR conversion, including strategic services such as:

- Change management

- Leadership of the project or projects

- Definition of the team structure and organizational committees required to properly guide your project

- Creation of a training and support structure that meets the future needs of your end user community

Galen's seasoned analysts leverage a broad and vast amount of experience in all aspects of conversions – extracting data from the legacy system, cross-referencing and mapping from one nomenclature to another, and loading safely into the target system keeping desired workflows and functionality intact.

We believe that no source system is too complex or large. Our analysts have encountered it all – hosted and local source systems, database sizes both large and small, a litany of image formats, scans and forms, and all flavors of relational database vendors and schema – MYSQL, PostGreSQL, SQL Server, DB2. We leverage a library of extraction resources to pull your valuable clinical data safely and accurately.

Conversion Platform

Based on decades of experience, Galen has developed an industry-leading automated conversion platform. The GalenETL process includes:

- **Automation:** Automates data extract, transform and import, including highlight of all potential errors during rehearsal load into live

- **Intelligent Mapper:** Automated suggestions of mappings from source to target nomenclature/codification

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- **Automated Validator**: Automated validation of discrete conversions including summary and detail of errors, defects and overall statistics

- **Archiving:** Application housing extracted data and by-patient lookup of well-formatted chart summary

In addition, Galen has deep experience providing conversion services such as:

- **Data Extract & Import:** Extraction of data from the legacy source system and discrete and/or non-discrete import into target system

- **Project Management:** Keeping the conversion project on track, mitigating competing projects, maintaining scope, and managing key deliverables/timelines

- **Conversion Analysis:** Clinical data mapping, configuration, validation and testing

GALENETL–DATA ACQUISITION & TRANSFORMATION

- Extensible, plug-in based architecture
- Proven libraries
- Scalable

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CONNECTIVITY & TRANSFORMATION PLATFORM

- Support of multiple:

  Standards (HL7, CCD, XML, EDI, PDF)

  Nomenclatures (ICD-10, CPT, LOINC)

  Technologies (MSSQL, PostgreSQL, Oracle, MySQL, Cache)

PRACTICE MANAGEMENT SYSTEMS

ELECTRONIC FINANCIAL MANAGEMENT SYSTEMS

ELECTRONIC HEALTHCARE RECORD SYSTEMS

ENTERPRISE RESOURCE PLANNING SYSTEMS

SIEMENS
Global network of innovation

GE

MCKESSON
Empowering Healthcare

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