How We Make it Happen:

Transplant Data Conversion

Introduction

Epic Phoenix equips your transplant staff with a powerful and versatile system that streamlines workflows and consolidates transplant data within your enterprise-wide EHR. However, when implementing Epic Phoenix, unless you convert the majority of your legacy transplant data, the implementation benefits will be limited, workflows muddled by having to access the old system to see charts, and reporting complicated because old and new data must be continually merged. The key to unlocking the full potential of your Epic Phoenix system is to convert data from your legacy transplant system to your enterprise-wide EHR. Using our proprietary processes, custom tools, and extensive experience, we help transplant centers achieve full value from transitioning their legacy data and workflows to Epic Phoenix.

Challenges

While all EHR migrations are challenging and require extensive data conversion, many factors make transplant conversions especially complex.

Extended Continuity of Care

Decades of important information on each patient need to be migrated and must appear in Epic Phoenix in the appropriate sequence, in order to show the whole picture of a patient's transplant record. This can include many years of details such as health monitoring for a listed patient, key dates and care team information, immunosuppressive therapy changes and monitoring, graft survival checks, and retransplants. Additionally, legacy transplant systems often contain thousands of notes authored by a variety of provider types across multidisciplinary teams. Often these notes are stored in formats and sizes that are not initially compatible with Epic.

Lack of Interfaces

Legacy transplant systems often do not fully interface with the enterprise-wide EHR. This means that the unique patient ID in the legacy transplant system may not match the patient ID in Epic. This also means that the legacy transplant system may not have received demographic updates from the enterprise patient management system, rendering things like a patient's address and phone number out of sync between the legacy transplant system and Epic. Finally, the legacy transplant system is often the source of truth for things like cause of death and patient status. Reconciling this important information is critical to the success and day to day operations of the organ transplant department.

Race and Ethnicity Specificity

Organ sharing partners (e.g. UNOS) often require more specificity when it comes to documenting a patient's race and ethnicity than is required in other healthcare specialties. This means that your Epic installation may not have matching terms for each race and ethnicity that need to be converted from a legacy transplant system.

Results

Lab, microbiology, and HLA results may be stored differently between legacy transplant systems and Epic. One system may keep a result in a narrative format where another may store it in a numeric result field. The legacy system and Epic may also differ in the way they manage the donor/recipient relationship documented in HLAs, which show potential compatibility for transplant. Furthermore, the legacy system may not identify lab orders the same way that Epic does.

Documents

The types of scanned documents that need to be migrated from legacy transplant systems often don't match document types available in Epic and the enterprise document imaging system, and HIM departments may not allow all of the missing types to be created. Also, the vast number of documents, and the storage size of the images, make migrating them difficult, as do the varying needs and complexity of the common destination systems (e.g. OnBase).

Care Team

Tracking a transplant patient’s multidisciplinary team and referring providers is key to the success of a transplant program. Legacy transplant systems are often the source of truth

for a patient's multidisciplinary team and referring provider details. It is imperative that this information is accurately converted and any missing records are created in Epic during an implementation.

Episode Chronology

Finally, legacy systems often do not link records from one transplant phase to the next. This is not a problem when a patient has only one referral, evaluation, candidate listing, and/or transplant record. However, if the patient has multiple of any of these records, the conversion solution must include a method for establishing relationships between the records in order to assemble them into one transplant record. Some legacy systems do not include related previous phase identifiers within each referral, evaluation, candidate listing, or transplant record. As a result, it is common for this linkage to not exist for the records being converted, creating many challenges. These episodes must be assembled as accurately as possible since the transplant episode record in Epic is the central data set to which all other transplant data is linked.

Manual Approach to Conversion

Some transplant centers have employed a manual process to address these unique issues related to transplant data conversion. However, this approach requires clinical subject matter experts to work through the entire database, connecting individual phase records to other related phase records and making other adaptations. Once this is done, they run a query to extract the unified transplant records based on the linked record identifiers. This approach is time-consuming and expensive. Due to the hundreds of hours of tedious analysis and documentation, there is also substantial risk of human error with this method.

Our Approach

To reduce the risk and cost associated with these challenges, Health Data Movers has created a ten-step process.

Step 1: Planning

All successful projects start with a good plan and a well-defined scope. There are a number of activities to perform when planning a transplant data conversion project. First, we develop prerequisites and requirements, including defining the scale and scope of legacy vendor extracts. HDM will help establish a governing body to determine how far to look back for data (e.g. 5 years, 10 years, or all data), the patient population to migrate, and what types of data are in scope. Migrating labs, notes, allergies, and problems are fairly standard; more complex data types like medications, future orders, and unstructured data

can also be migrated, but increase the number of resources and technology required to successfully convert the data.

Another component of conversion planning is developing an environment strategy. HDM works closely with the Epic technical team to document a strategy that includes the best refresh schedule and environments to use for validation and testing sessions.

Finally, we create a resource matrix showing what clinical and operational roles will need to participate in design meetings and data validation, and the total expected time requirements for each role.

Step 2: Value Mapping

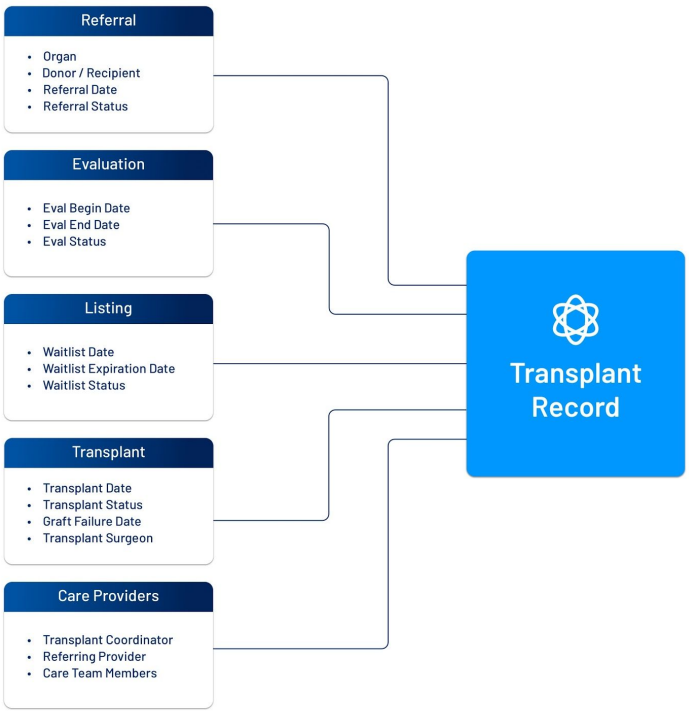
The technical part of the project begins by working with the customer to map terminology and category values such as transplant phases/statuses, race/ethnicity, and donor criteria from the legacy system to their counterparts in Epic. When a term or other value doesn't exist, we work with the appropriate Epic application teams to create a new option to map to in Epic.

Step 3: Extracting Transplant Phase Data

Once the values are all properly mapped, we query the data from the referrals, evaluations, candidate listings, and transplants data tables to produce one list with all of these records. Our algorithm assigns fields to mark which phase each record represents and whether the patient was a donor or recipient. Dozens of other data points are also extracted at this time that will link back to the main episode record in Epic.

We sort the records by patient, organ program, donor vs recipient, transplant phase, and transplant phase start date. We then use phase dating to establish a unified transplant record identifier to link the various records.

Unifying the transplant record can be challenging because one patient may have multiple



referrals, evaluations, and listings for the same organ. Additionally, human error during the initial entry in the legacy software means that some of the phase datings may not be accurate. Our programmatic logic compares the dates of each phase for the patient to identify each unique group of records and identify the correct phase dates to be included in each transplant record.

The logic also calls out probable accuracy issues in the data. For example, a user may have documented an evaluation end date that was after the patient's listing date. The rules apply customer-defined tolerances to decide whether to set the evaluation end date to the day before the listing date or highlight the case to be addressed by a subject matter expert prior to conversion. Another possible issue could arise if a user erroneously created multiple records for a single phase in the same transplant. Our logic is able to recognize this and select the appropriate evaluation date for the unified transplant record.

Step 4: Assembling Transplant Records

Once the probable errors have undergone human review and correction, our process assigns transplant record identifiers and merges the information from each of the phase records into unified transplant records. Since transplant data imports to Epic usually include data supplied by UNOS, we also work with Epic staff and customer subject matter experts to address any issues with merging the legacy transplant EHR and UNOS data. We then compile these transplant records into an Epic import spreadsheet.

Step 5: Record Mapping

Next, we work with the customer to map the various record values such as providers, users, dialysis facilities, lab codes, problems, etc. from the legacy system to their associated record in Epic. If a record does not yet exist in Epic (e.g. a specific facility or provider), we work with the appropriate Epic application team to create the missing records in Epic at this time. We also work with customers in this step to reconcile key data discrepancies (e.g. patient demographics or providers) between the legacy transplant system and Epic. Our team has a robust set of tools containing algorithmic matching logic to automatically map as many existing records as possible, saving a significant amount of time during the mapping phase.

Step 6: Preparing Notes Data

Like the transplant records, notes are often stored in several locations in the legacy system. We extract the notes from all locations requested by the customer, convert the data to plain or rich text, and produce HL7 files. Our logic identifies notes that are too large to be imported and generates a report of these notes so that clinical subject matter

experts can either manually create these notes in Epic, or HDM can provide direction on a custom solution for converting large notes into Epic.

Step 7: Preparing Scanned Documents

In addition to notes, transplant relies upon the storage and retrieval of many scanned documents (e.g. medical record documentation from other facilities). We extract a list of the scanned documents and translate the image hashes into PDF files and other file types. We work closely with the customer's HIM department to ensure that legacy document types map appropriately to document types in the destination document imaging system and that they provide adequate granularity for storing and receiving transplant specific documents. We then work with the customer's document imaging team to import these files into their integrated document imaging system so they can be viewed in Epic.

Step 8: Testing and Validation

HDM has built structure and process around methodical testing for all data conversions. At the beginning of each project, we plan a strategy for completing multiple rounds of testing in partnership with the technical/infrastructure teams and clinical end-users. The strategy includes environment planning documentation that lays out where and when data will be tested and which environment users are logging into to perform technical testing and data validation.

HDM works with Epic application teams and respective subject matter experts to plan validation sessions with specific workstations, worksheets, and workflows. We work to ensure that clinical end-users get as much exposure to converted data in Epic as possible throughout each phase of the conversion process.

Step 9: Cutover

As a result of our process and mapping efforts, most converted transplant data will appear to have been originally documented in Epic, leaving no conversion artifacts. The continuity of each patient's chart is preserved. Despite the extensive testing and validation already performed, we do one final load into a non-production environment and perform a final technical validation before moving your data to your production environment. Typically, we complete most of the data conversion and production load 5-7 days before the application go-live. Any new data entered into the legacy system between the production load and go-live are classified as "catch up loads" which we complete right before final cutover activities and go-live. The final UNOS and legacy system episode merge is reviewed and completed during this phase as well.

Step 10: Go-Live

HDM understands the importance of providing adequate support and engagement throughout go-live. Additionally, several critical steps must take place immediately after the final data migration to ensure a successful conversion. HDM resources remain engaged throughout all post-go-live activities including catch-up data loads, UNOS organ imports, and episode data cleanup. We work closely with the customer's command center and floor support resources to ensure issue tickets are resolved as quickly as possible. Given our extensive testing process, interface errors are generally minimal, but we closely monitor error queues and resubmit messages as needed to resolve HL7 interface errors. Throughout the process, we communicate with project leadership to ensure top issues are escalated and resolved as quickly as possible.

Proven Results

Our previous transplant data conversion customers have expressed that our seamless conversion process made the adoption of a new system easier and less complicated. Several of them are among Becker Hospital Review's list of hospitals with the best transplant outcomes. These customers include large university-based multi-organ transplant centers and small single organ programs all across the United States.

The complexity of caring for transplant patients demands unified, complete, and accessible information. We have aligned the tools and experience to provide that information and take the complexity and risk out of transplant data conversion. This enables you to provide your patients with the highest possible quality of care. Here are what a few clients had to say about our transplant data conversion projects:

"HDM single-handedly took our legacy data from our legacy application to Epic in just 4 months by using forward-thinking strategies. They were detail-oriented, organized, and always open to constructive feedback, making our business relationship effortless and us wanting to reach out for repeat business."

--Matthew Abraham, Director of Ambulatory Systems & Services, Stanford Health Care

"Your company has been a pleasure to work with and I know it will continue to do great things within the health consultant industry.... [Your consultant's] dedication to work, desire to experiment, and find new ways of achieving goals, out of the box thinking and personal involvement is unparalleled. [They] helped us to achieve many milestones that contributed to our overall success!"

--Tracy Magee, Clinical Systems Manager, UC San Diego Health

Engaging HDM

Whether you need to understand transplant data conversion better, want someone to oversee the project, or want a full team to get it done, we are ready to help. Our teams have completed over twenty full Epic Phoenix installs at large multi-organ transplant centers, the majority of which included a very large data conversion effort. We use a combination of our custom ETL utilities, industry-standard tools, best practices, and proven methodology and processes to ensure project success. Each full data conversion project takes about a year to complete. Our project teams typically include an account manager, project manager, Epic Bridges analysts, and conversion engineers from HDM working closely with your Epic Phoenix TS, Epic Bridges TS, Epic application analysts, and transplant clinical subject matter experts.

Additionally, we are a full-scale Epic application implementation and optimization firm with Epic Phoenix resources able to assist with any aspect of a Phoenix project including training, UNOS configuration, QAPI, and regulatory reporting, and go-live support.

Regardless of how or where your data is stored now if it's in scope, we'll make sure it's in your new EHR and ready for your clinicians day one. The project is not done until all your data has a new home, and we've thoroughly confirmed it's arrived.

For more information, contact your Health Data Movers Account Manager, or contact us at:

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