

HIM Briefings



Solving master patient index conundrums during EHR consolidation: Lessons learned at Avera Health

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The future of healthcare is clearly larger health systems with integrated provider networks to serve bigger patient populations and more expansive geographical footprints. The biggest indicator of this healthcare trend is provider consolidation, which continues to occur at a rapid pace. In fact, health system and hospital mergers and acquisitions were up 11% in 2018, with three of the 30 transactions announced in 2018 representing mega deals—over \$1 billion in revenue (Kaufman Hall, 2018).

As organizations merge and combine electronic health records (EHR), new challenges for data integrity and electronic master patient indexes (EMPI) emerge. Errors such as duplicates, overlaps, and record overlays are common and can be costly. Some examples are:

- Duplicates result when a patient has two records

in the same system or facility.

- Overlaps occur when the same patient has a record in more than one facility or system. If the issue is not identified and addressed properly in the conversion, these overlapping records will create duplicates in the new EHR.
- Medical record overlays occur when one person's record is overlaid on another within the new EHR, resulting in a single record containing information from two patients. This poses the greatest risk.

These errors drive serious negative consequences for clinical care, patient safety, billing, and revenue. A number of sources report the cost of duplicate records to be as much as \$800–\$1,000 for emergency room records and \$1,500–\$2,000 per stay for inpatient records. A single medical error caused by an overlay can cost hundreds of thousands or even millions of

dollars in repeat tests and treatment, billing errors, and duplicate correction. This article proposes new strategies to identify, repair, and prevent data integrity and MPI mismatch issues during EHR consolidations.

Preempt EHR issues with early duplicate detection

All IT vendors understand that loading dirty data results in poor user adoption, shoddy system performance, and failed return on investments. This is especially true for EHRs. Prior to major system consolidations, EHR vendors typically require the organization to reduce the duplicate rate within legacy EMPIs to around 2%–3% prior to go-live. This represents a massive undertaking for the provider organization, one that is often underfunded and misunderstood by executive teams.

At Avera Health, an integrated health system based in Sioux Falls, South Dakota, 2.5 million patients are served across 34 hospitals, 215 primary and specialty care clinics, and 40 senior living facilities. The organization also owns homecare and hospice, sports and wellness facilities, home medical equipment outlets, and more. With an enterprisewide EHR consolidation ahead, the organization's HIM and IT teams recommended a thorough analysis of existing medical record duplicates and rates of patient overlap across their six regions in order to achieve the following goals:

- Define the extent of the problem
- Avoid hindering quality and patient safety during EHR consolidation
- Use technology to identify duplicates and overlaps across systems
- Minimize disruption to the aggressive EHR implementation timeline
- Analyze identified issues to prevent future problems and errors

The first step in the process was to convey to Avera's executive team that an EMPI cleanup project must be completed prior to the EHR conversion go-live.

Overcome tendency to deny EMPI duplicates

It is common to deny EMPI errors. Organizations prefer to believe problems don't exist. However, these issues are quite frequent and always expected during times of system consolidation. Patients forget whether

they've been seen at a specific facility, and as the organization changes names, the problem grows exponentially. Patients also travel from one facility to another for care—making duplicates a frequent component of day-to-day operations.

At Avera, the executive team was aware of the enormity of the project and potential for patient safety concerns. Long-standing legacy islands of hospital information systems would be eliminated as the organization moved to a single EHR platform—making EMPI duplicates an even greater challenge. Inability for Avera clinicians and staff to view patient information in its totality across the enterprise was an unacceptable outcome. The challenge expanded beyond only trying to create a single medical record number for each patient and grew to include all of the patient's clinical and financial data.

Consider purpose-built applications for EMPI cleanup

Most core IT systems, including EHRs, are not adept at identifying duplicates—and even less expert at analyzing EMPI issues across multiple applications. The team recommended a purpose-built application to conduct the EMPI cleanup project. Data was loaded into the vendor EMPI and associated cleanup application in May 2017 to identify any existing problems.

The company returned data showing that duplicate and overlap issues did exist. With limited resources to tackle EMPI cleanup before EHR go-live, Avera also tapped the vendor's expertise to manage and execute the project. The first few phases were very IT-centric, as the data was extracted, analyzed, and processed to identify duplicates and overlaps. Duplicate detection is typically performed using an algorithm. There are three types available for healthcare EMPI cleanups in the market today.

Probabilistic algorithms prove most effective

The three types of algorithms include deterministic, rules-based, and probabilistic. Deterministic algorithms require an exact or near-exact match on key demographic elements. If the elements do not match exactly or if certain elements (such as Social Security number) are not available, the algorithm is unable to find a match. For this

reason, deterministic algorithms do a poor job of identifying duplicates where there are multiple spellings of a name, transposed digits within a Social Security number or date of birth, or reordered names. This is the least accurate form of duplicate identification.

Rules-based algorithms assign a weight or score to each element and an aggregate score for the record pair based on a set of matching rules. This type of algorithm requires the organization to determine the weight (i.e., number of points) each data element is worth—an unrealistic task for most IT departments or HIM experts.

In addition, the weight for a particular element (such as name) is not adjusted based on frequency. The first name John and the first name Ulysses get the same score even if one is very common and the other is extremely rare for that population. Rules-based algorithms typically find a higher number of false positives and may miss some duplicates completely because they are not built to look for certain things such as transposed names (“Francis, James” vs. “James, Francis”).

The most effective and best-practice algorithm to use is probabilistic. This algorithm is self-tuning. It adjusts its value for each set of data based only on the frequency of data within the specific data set. This frequency analysis is the most important feature of a probabilistic algorithm because it customizes the weighting and automatically assigns a higher weight to unique data (such as Ulysses) and a lower weight to common data (such as John), enabling it to adjust to variations in populations across the country.

Probabilistic algorithms, by nature, tend to find a higher number of valid duplicates and a lower number of false positives. They are considered the best available matching, according to industry experts such as AHIMA. Based on these considerations, Avera Health decided to employ a probabilistic algorithm for its MPI cleanup project.

Shared wisdom from Avera Health: Seven practical tips

As health systems continue to consolidate and add more data to their networks, the importance of maintaining accurate patient data will continue to grow. During the EMPI cleanup project, Avera Health’s HIM team learned a number of valuable lessons and continue to benefit from the

process. Here are seven important tips for organizations preparing for an EHR consolidation:

1. Start early. This is a lengthy and labor-intensive project that requires a defined budget and clear time expectations.
2. Include key stakeholders. Project managers from both sides, HIM systems analysts, IT engineering staff, HL7 messaging expertise, and hardware teams are all required.
3. Understand new EHR capabilities. Know what is coming in the new EHR system with regard to EMPI and patient information overlays.
4. Include on-site visits. Ask your EMPI cleanup vendor to come on-site, review all data to be merged, and identify the proper project team.
5. Conduct weekly calls. Schedule regular calls with your vendor to cover all identified issues.
6. Maintain momentum. Once the project is finished, continually compare volumes of EMPI duplicates and data overlays. Analyze system reports to identify areas for staff education and improvement.
7. Expand the focus enterprisewide. The whole health system should be aware of downstream problems and costs associated with incorrect patient information. Extend your efforts across all hospitals, clinics, and owned physician practices. 🏠

REFERENCE

Kaufman Hall. (2018). 2018 hospital merger and acquisition activity continues rapid pace with 30 announced transactions in the first quarter. Retrieved from www.kaufmanhall.com/news/2018-hospital-merger-and-acquisition-activity-continues-rapid-pace-30-announced-transactions.

EDITOR’S NOTE

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