An EMPI Can Integrate the Delivery System

The EMPI is becoming the access point for linking patient information from multiple clinical and financial systems. HIM professionals’ roles will expand and become more visible with the increased responsibility of monitoring and maintaining the data integrity of an EMPI.

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Delivery systems are now the norm in the health care industry. With the incorporation of many entities into one organization, the functionality and maintenance of the master patient index (MPI) has been transformed into a more complex Enterprise MPI (EMPI), which allows a patient to be identified both longitudinally and across the continuum of care. The EMPI becomes the access point for linking patient information from multiple clinical and financial systems. The creation of patient-centric views of patient data, as opposed to facility-specific views now available, is a necessary step in integrating care across facilities. This is an important step in actually becoming an integrated delivery system (IDS).

As patients enter the delivery system, they must be accurately identified and assigned a medical record number. Variation is inherent to the process of assigning identifiers. It creates a fragmented view of the patient that, in turn, creates numerous problems that ripple across the facility and spill into the entire organization. Variation upsets physician-staff relations, ties up limited resources needed to resolve errors, and most importantly, increases clinical and legal risks.

The Patient Bill of Rights, the Health Insurance Portability and Accountability Act (HIPAA) and the recent publicity of adverse medical events will only serve to increase an organization’s exposure to this problem. If health care delivery is to be significantly improved, fragmented processes and data integrity issues need integrated approaches. A well-designed EMPI is an important element in managing variation in patient identifiers, thus enabling improvement of integrated processes.

The role of health information management (HIM) professionals will expand and become more visible with the increased responsibility of monitoring and maintaining the data integrity of an EMPI. This expanded role for HIM professionals will require a working knowledge of an EMPI, including patient identifier variation, functionality of the EMPI, review and resolution of errors, and integration with the IDS.

Patient Identifier Variation

There are two basic categories of patient identifier variations that must be managed to maintain data integrity and success with enterprise applications (see Figure 1). The first category of variation involves errors created during patient identifier assignment. The most widespread error is the assignment of multiple medical record numbers (MRNs) to the same person, commonly referred to as a “multiple” or a “duplicate” MRN. Another common error is the “overlay,” which occurs when multiple persons are assigned the same medical record number.

What is the extent of this problem? A recent sample of 109 MPIs showed an average error rate of 9 percent; those containing more than 1 million records had an average error rate of 11 percent. The latter indicates that approximately one out of every 20 MRNs was assigned in error.
The second category of variation is not a result of an error, but occurs when a patient visits more than one facility and consequently is issued different MRNs by the various facilities within the IDS. This is a natural result of individual facilities maintaining their own MRNs.

The first category of variation, errors in the MRN assignment process, complicates the successful management of the second category of variation, the linking of different MRNs from across the enterprise. One error at the facility level converts to multiple errors at the enterprise level. The goal is to produce one unique set of identifiers that describe an individual patient. At a facility level, this means one MRN per person. At the enterprise level, this means one set of identifiers comprising one MRN per facility, or one MRN to be used by all systems across the enterprise.

**Functionality of the EMPI**

One of the EMPI’s key functions is to manage variation in patient identifiers that occur within individual MPIs as well as across the enterprise (see Figure 2). Potential errors can be minimized through the use of improved patient search tools, sophisticated comparison algorithms during review, and efficient user interfaces.

Additionally, basic EMPI functionality should establish the enterprise linkage of MRNs from across the delivery system and provide:

- Highly accurate algorithms for detecting patient identifier errors and establishing linkages between records representing the same person;
- High performance for providing real time record comparisons;
- Efficient review and resolution of potential errors; and
- Integration with existing systems.

**Comparison Algorithms**

Powerful comparison algorithms are a necessary component of any EMPI to successfully manage variation in patient identification. Algorithms are used to score record comparisons during patient lookup, to detect potential errors after registration and to link records across the enterprise.

Most vendors use an “exact match” algorithm, based upon a combination of name, date of birth, gender and social security number. They may include some level of fuzzy search—not quite exact—using partial names. These are defined as “deterministic” algorithms.

The second type of algorithm is called “probabilistic” because comparison scores are based upon the relative frequency of occurrence of attribute values being compared. As an example, assume that two records being compared are from an MPI where the name Smith occurs more frequently than Hewitt. In this case, matches involving the name Smith would yield a lower score (less likely to represent the same person) than potential matches based upon the name of Hewitt (higher probability of a match). A probabilistic algorithm uses a number of other search procedures to identify variation, such as searches by social security number, alternative keys, phonetic keys or by telephone number.
Review and Resolution of Errors
The review and resolution of potential errors is of crucial importance. If errors in the internal MPIS are not corrected, they will migrate to the various MPISs linked to the enterprise, potentially causing the same problems to appear multiple times. This becomes a serious problem with decentralized registration areas and multiple linked registration systems. HIM professionals are the primary users of error review and resolution tools. These tools should not only identify potential errors but also provide work queuing and management reporting to effectively monitor corrective efforts for all systems.

Integration
The value of the EMPI is predicated on its ability to integrate into an organization's environment. During EMPI implementation, the data from existing MPISs is loaded into the EMPI. This necessitates analyzing the existing data to determine the level of data integrity within each source system to be loaded. High-error levels within source systems will influence the number of enterprise-linkage errors that are made. After a strategy has been developed to correct existing errors, the EMPI can be loaded.

The next major source of integration is the development of interfaces from the existing source systems to provide all registration event type messages, such as new registrations, demographic updates, medical record merge transactions, etc. If developed properly, they will provide the EMPI with all MPI-related transactions. When the interface is turned on, the EMPI should begin checking each message for potential errors. If a correction is required, the source system MPI will also need to be corrected. This can be done manually or via an interface to the source system.

Role of the HIM Professional
The HIM professional will be central to a coordinated effort of EMPI maintenance throughout the IDS. The main HIM challenges will be in identifying problem areas requiring process re-engineering, timely correction of computerized systems and communication to all interfaced systems so that all duplicate records are linked using a single, unique patient identifier. An HIM manager must have specific knowledge of issues occurring in an IDS to develop effective process workflows, to provide feedback for corrective work and to troubleshoot technical issues. These challenges are essential to maintaining EMPI data integrity.

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