Double Trouble

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Using Health Informatics to Tackle Duplicate Medical Record Issues

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Are You battling with duplicate medical record issues in your organization? Data quality issues are trending in health informatics and information management (HIIM) as technology becomes more advanced and plays a pivotal role in managing health information. Duplicate medical records are a common data quality issue causing growing concern, which has direct consequences for compromising patient safety, medical care, data accuracy, and reimbursement.

Rapid advances in technology are enabling organizations to wield new tools and solutions against the duplicate medical record problem. Informatics offers a powerful approach to solve, prevent, and manage duplicate medical record issues, and HIIM roles play a vital function in this fascinating and challenging area of innovation in the healthcare industry.

Scope of Duplicate Medical Record Issues

Duplicate medical records are defined as two or more health record numbers assigned for a single patient at the same healthcare facility. This is a patient identification error that is usually created by patient registrars in healthcare organizations' admissions departments—the patient identification process at the time of admission was not handled appropriately and accurately. Human error is not the only factor. The rapid growth of technology adoption in healthcare organizations has often led to multiple systems for clinical, administrative, and specialty services being used separately and simultaneously within healthcare facilities, thereby also increasing the possibility of duplicate records.

The prevalence of duplicate records in most hospitals has been generally estimated between five percent to 10 percent of all stored records.[1,2] However, health systems that have multiple facilities or have merged with other systems are seeing duplicate rates around 20 percent. Duplicate rates also differ based on healthcare setting. For example, physicians' office settings are known to have a duplicate rate at five percent, which is the "acceptable" rate for all healthcare settings. In contrast, according to a Gallagher Healthcare Practice report, one medical record consulting firm was employed to remove approximately 250,000 duplicate records, which represented 22 percent of the Master Patient Index (MPI) of one metro urban hospital system.[3]

Patient registrars have the responsibility to properly validate a patient's identity and accurately enter patient information into the MPI. Best practices state that patient registrars validate a patient's identity by reviewing a photo ID or search for the patient in the MPI; however, this process may not always validate record location accurately and thoroughly. Patient registrars can search for a patient using various identifiers such as first and last name, date of birth, and Social Security number, just to name a few. Even when using these identifiers, patient registrars may transpose numbers or letters, causing the previous patient record to not populate in the system. The transposition of numbers and letters can also occur when the patient registrar is entering the patient's information into the MPI for the first time.

Patients can also contribute to the problem of duplicate medical records. When patients present to the registration department, they may provide different names during their encounter than what is listed on their photo ID, such as nicknames, married names, or a middle name. As such, incorrect information could be used and thus duplicate records created.

Usually, identification of duplicate records is not done proactively. It may be accidentally discovered when searching for a patient in the MPI, unless a systematic search is purposely conducted to identify the duplicate records. With the advancement of health informatics, some MPIs can detect potential duplicates—such as with the use of an algorithm. When HIIM departments hire a consulting company to perform MPI clean-ups, the initial phase of the project consists of an extraction of all potential and confirmed duplicates from the facility's MPI to the company's software for review. A healthcare organization cannot be certain of the scope of its duplicates problem unless proactive searches are done periodically.

Informatics Solutions to Solve and Prevent Duplicate Records

There are several solutions or tools that may be adopted to solve and prevent duplicate records from an informatics perspective, such as algorithms, smart cards, biometrics, advanced enterprise master patient index, and radio frequency identification technology.

Algorithms are automatic rules to identify problems. Algorithms can solve and prevent duplicate records by providing patient registration clerks and HIIM professionals with an accuracy rate between two records that may or may not be the same person. Algorithms are used in hospital information systems, and several different algorithms are used, including deterministic, probabilistic, and rules-based. Deterministic algorithms yield a 50 to 60 percent accuracy rate as they require exact or phonetic matches on certain data elements.[4] Deterministic means the results are predictable. For example, if a duplicate record pair has the exact name, address, and date of birth, it is more likely to be the same person. Probabilistic algorithms provide an accuracy rate up to 95 percent or higher as they determine precise record linkages by using complex mathematical principles to help analyze organization-specific data. Rules-based algorithms have a more advanced matching method that utilizes pre-set confidence levels for certain data elements and offers an accuracy rate between 70 to 80 percent.[5]

Smart cards look very similar in size and shape to credit cards and include an embedded and integrated circuit chip that can either function as a microcontroller chip with internal memory or a secured memory chip alone. The card communicates with a reader either through direct physical contact or with a remote contactless electromagnetic field that energizes the chip and transfers data between the card and the reader. Smart cards are widely acknowledged as one of the most secure and reliable forms of an electronic identification token. Additionally, smart cards can authenticate identity by storing encrypted personal demographic information such as date of birth, sex, and race. Once patients are registered, registrars transfer data onto the cards and they are given to patients at the point of registration. Patients will present the card at the point of registration for each subsequent visit for efficient check-in and patient identification.[6]

Biometrics is another informatics approach gaining popularity. With biometrics, physiological characteristics of the human body can be used by healthcare facilities to seamlessly identify a patient by scanning their biometric identity. Biometrics include iris, palm vein, and fingerprint scanning. Iris scanning supports hospital infection control initiatives and is very effective in preventing duplicates as there is a low occurrence of false positives and extremely low (almost zero percent) false negative rate.[7] Palm vein biometric identification relies on matching technologies that can't completely prevent duplicate medical records at the point of service. As such, fingerprints are the most well-known biometric modality but require physical contact with a hardware device, which is not conducive to infection control in a hospital setting.

An advanced enterprise master patient index (EMPI) is a master patient index that houses patient information for multiple locations within a health system. An advanced EMPI system integrates the data from these disparate systems and forms an overarching technology umbrella, resolving and synchronizing data issues and providing a single patient view that can be accessed across the enterprise. The EMPI resolves data quality issues and synchronizes back to enable accurate patient identification and matching that minimizes duplicate records.

Radio frequency identification technology (RFID) is another potential method to prevent duplicate records. However, it is still in its pilot stages in the healthcare industry. Patients wear a smart wristband identifying patient demographics when scanned by a RFID reader. Some facilities have participated in pilot studies for the RFID technology, but many facilities have concerns about costs and feasibility of the technology's use in the healthcare setting.

Duplicate Records have Multi-dimensional Impact

Duplicate records can potentially have a negative impact on multiple dimensions within a healthcare organization, specific to providers, patients, and HIIM professionals. When duplicate records are present in the EHR, data can become conflicted amongst providers, causing poor patient care and incorrect treatment. For example, a physician may locate two records for a patient and select only one of the records as a reference for how he/she would administer treatment for the patient. This physician could then prescribe a medication for the patient that produces an adverse reaction, causing the patient to be referred for emergency treatment.

Another area duplicate records can have a negative impact on providers is in medical malpractice litigation. Risk management professionals have confirmed that duplicate records have caused negative outcomes in the discovery phase of the litigation process because there will be discrepancies with diagnoses, medications, and allergies. If the data are not accurate, attorneys will have difficulty presenting a case to support a provider. Ultimately, duplicate records lead to future increases in medical malpractice claims and deteriorating loss experience for healthcare providers. The consequences can be expensive—one recent malpractice claim settlement totaled $521,560.[13]

HIIM professionals are also impacted by duplicate records. For example, from a systems impact perspective, it is not recommended to implement a new EHR if the duplicate record rate is high within the healthcare organization. From a workflow and staffing perspective, most HIIM departments try to resolve their duplicate record issues in-house, but then realize they are not equipped with an adequate number of employees to cope with the ratio of duplicate records present. HIIM professionals will then need to hire a consulting company that specializes in duplicate record clean-ups; however, to purge one single record may cost the organization more than $96.[14] Additional overhead costs from the vendor may include travel expenses if the project is not being completed remotely. The overall financial impact of duplicate records can total up to $40 million for a healthcare organization because of malpractice litigation and duplicate clean-ups, according to an article in the Journal of Technology Research.[15] This will ultimately have a negative impact on the business performance of the organization.

HIIM Professionals Role in Reducing Duplicate Records

The role of HIIM professionals in the identification, prevention, and management of duplicate records has become more advanced with the use of health informatics. Traditional roles of HIIM passively discovering and identifying duplicate medical records will be substituted by technologies and informatics applications.

When MPIs have algorithms available to detect potential duplicates, a red flag will be sent up. HIIM departments are notified by patient registration or other ancillary departments of the existence of a duplicate record set. HIIM professionals will then review and merge the duplicate set accordingly using set standards and policies for manually resolving duplicate records.

HIIM professionals also play an important role in the use of smart cards. HIIM professionals collaborate with information technology (IT) for encryption of the smart cards that are distributed to patients. They are responsible for ensuring patient information is protected, secure, and confidential per the Health Insurance Portability and Accountability Act (HIPAA). Additionally, HIIM professionals play an integral role in encouraging patients to become more involved in managing their patient information as consumer informatics becomes more prevalent in healthcare (i.e., use of patient portals).[8] The smart card allows patients to manage their basic demographic and medical information, which is a goal of consumer informatics.

Biometrics captured in patient registration are linked into the electronic health record (EHR), where HIIM professionals can view as they manipulate through patient records within the EHR. Data integrity teams can view patient records and ensure photos, fingerprints, etc. are properly integrating to each respective record. The same process can be used with the RFID technology. HIIM professionals can ensure the data from the wrist band is successfully transferring into the EHR as data is transferred from the wristband to an application on the server and, finally, to the user.[9]

The EMPI is managed by HIIM professionals responsible for managing the data integrity of patient information across multiple healthcare facilities within a healthcare system. Algorithms or other indicators of potential duplicates may be integrated into the EMPI and HIIM professionals are responsible for resolving those duplicates respectively, as well as working with IT to develop interoperability standards to ensure efficient performance across the health system and other applications that are utilized.

HIIM professionals may also play a role in managing duplicate records by collaborating with patient registration departments in healthcare organizations to provide continuous staff training on accurate patient verification processes and providing feedback to improve patient matching skills.

A further step would be HIIM professionals developing a quality improvement and data quality team that is responsible for monitoring, reviewing, and correcting duplicate records. HIIM professionals may collaborate with IT professionals to establish consistent patient identifiers in the MPI, which may include—but are not limited to—name, date of birth, maiden name, and gender. It may also be important for HIIM professionals to educate patients to ensure their patient registration is accurate by providing their legal first and last name and verifying it with a form of acceptable documentation.

HIIM professionals may also encourage patients to look over his or her information before being admitted and entrusting a friend or relative to provide accurate information if the patient is unable. Patients must understand the importance of providing consistent identification information across facilities to prevent duplicate entries, especially as mobile health becomes more prevalent and patients start taking a more active role in managing their information through personal health records.

EHR Interoperability and Duplicate Health Records

As healthcare technology continues to advance, healthcare organizations want to create seamless transitions of health information from one facility to the next. But accurate identification of patient information becomes convoluted when sending information from one place to the next. AHIMA, the College of Health Information Management Executives, and the Healthcare Information and Management Systems Society are advocating for a national patient identifier that will assist hospitals in accurately exchanging medical information and patient health records and prevent skewed data in the EHR.[10]

Another initiative to watch is a patient matching EHR solution developed by the Regenstrief Institute's Center for Biomedical Informatics.[11] With the assistance of a $1.7 million grant provided by the Agency for Healthcare Research and Quality, the initiative aims to develop and test evidence-based solutions to improve patient matching accuracy and reduce patient harm resulting from health record misidentification. Furthermore, the Office of the National Coordinator for Health IT launched the Patient Matching Algorithm Challenge to promote the development of new patient matching algorithms as well as transparency regarding the performance of patient matching methods.[12]

Duplicate records are a popular issue amongst healthcare organizations since they wreak havoc on organizational performance and data quality. Health informatics plays a pivotal role in minimizing the rate of duplicate records. HIIM professionals must take the lead in recognizing and understanding this problem and ultimately providing viable solutions through not only technology but collaboration amongst other major stakeholders that share the common goal of tackling duplicate records as well.

Notes

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