

Duplicate Medical Records: A Survey of Twin Cities Healthcare Organizations

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Abstract

Duplicate medical records occur when a single patient is associated with more than one medical record number. This causes a dangerous and expensive issue for hospitals and health information technology. A survey was constructed to gather qualitative information from Twin Cities healthcare organizations. The goal was to determine baseline information regarding the recognition of the problems surrounding duplicate medical record creation and organizational strategies for resolutions. The survey demonstrated that all organizations acknowledged the importance and patient safety issue regarding the creation of duplicates but the strategies and solutions are varied. As defined in the Minnesota Alliance for Patient Safety⁵, the ultimate goal of this survey was to favorably impact patient safety. The deidentified results were disseminated to all participating organizations along with recommendations for system improvements in order to raise awareness of the issue and promote patient safety.

Introduction

Duplicate medical records occur when one patient is associated with more than one Medical Record Number, or MRN. The existence of duplicate records in a healthcare system is one of the most critical issues currently facing health information technology (HIT) departments³. Duplicate medical records are often erroneously created as a result of inaccurate data entry. These duplicates, or dupes, can have negative impacts on registration and billing systems, but more importantly on patient safety. With the existence of multiple records for a single patient, it is likely that healthcare providers will miss critical information because it is located in the duplicate. In addition, the existence of a duplicate record can lead to unnecessary replication of lab orders and tests causing the cost of treatment for an individual patient to rise.

A study was conducted Johns Hopkins Hospital to investigate the role that the patient registration process plays in the creation of duplicate records³. They found that 92% of the errors resulting in duplicates over the course of the fiscal year occurred during inpatient registration. Examples of the errors

that can occur during the registration process include misspelling, transposition or incorrectly keyed date of birth or social security number, and failure to check valid sources of identification or confirm core data elements.

If the organization does not have an effective algorithm for matching equivalents that are not an exact match dupes can also be generated. Examples of these equivalents would be entering "St." instead of "Street" or "NE" instead of "Northeast." There are a variety of algorithmic methods that can be applied to the matching issue including string comparison methods, bigrams and trigrams, phonetic matching, and probabilities to calculate the value of a determination². These algorithms can often be too sensitive, or not sensitive enough. If the system is over-sensitive, the admissions clerk can become fatigued by false positives and generate a new record without reviewing the possible matches. In addition, the algorithm system must not only be accurate but must be fast.

The Cost of Duplicates

It is difficult to pinpoint what the actual cost is related to duplicate creation, identification, and merging. Additionally, it would be impossible to calculate the costs of the consequences associated with a major patient safety event. Each healthcare organization has a different method or process to deal with the creation of duplicates. Quite often an exact figure cannot be discerned because employees solve the problem when it arises without tracking the amount of time it required to repair. However, some health systems have made attempts to calculate the costs.

According to Fox and Sheridan, an average organization's duplicate rate is typically between 5-10% for a single hospital⁴. Using their estimate of \$50.00 per duplicate pair for an organization in hidden operational costs, a hospital that creates only 5 duplicates a day would end up spending \$78,000 per year as a result of duplicates. It is important to note that in this article they used a six day week for their calculations. However, hospitals do not refuse admissions to patients when the HIM staff is not working and searching for duplicates. In other words, duplicates would still be created on the

seventh day, and therefore they should be considered in the calculations causing the cost to rise to over \$91,000 per year.

The process for bringing in an outside company for a de-duping procedure can also be a costly endeavor. In 2005, a Twin Cities' healthcare organization that wished to remain anonymous admitted during a preliminary interview that an external consultant company that specializes in clean-up had been hired. They reviewed 65,000 potential duplicate pairs. They merged 22,000 pairs, but the remaining 38,000 pairs were reviewed and not merged due to missing or conflicting information. This process cost the organization \$729,000. If an organization continues to fix the problem as opposed to preventing it, they could end up performing the same costly fixes every few years.

Inaccurate patient data also impacts the claims process. One-third of every healthcare dollar is spent on administrative, upfront tasks⁷. Most people blame the downstream billing process when a claim is rejected. Yet, the majority of errors stem from front-end processes such as registration. One article even states that securing accurate patient information can prevent 90 percent of claim denials⁷.

Methods

Based on the background research conducted, a 10 question survey was constructed in conjunction with regarding the presence of duplicate medical records in the Twin Cities. The survey was part of a class project that was sponsored by John R. (Skip) Valusek and the HealthEast care system based in the Twin Cities. A classmate, James W. Lee assisted in the creation of the survey and initial background research. The healthcare organizations contacted were given a choice to complete the survey independently via email, or to participate in either a phone or face to face interview. They were not given any time limits for their responses. All of the organizations were guaranteed that their survey responses would be de-identified for the purposes of the research paper and presentation. In addition, they were also told they would be provided with copies of the survey findings.

Results

Eight healthcare organizations in the Twin Cities area were contacted regarding participation in the study. Out of those who were contacted, 7 completed the survey, 6 electronically via email and one by interview. Three of the responding organizations represented single hospitals, and the remaining 4 responses were from systems ranging from 2 to eleven hospitals. The smallest hospital responding

has approximately 300 staffed beds, and the largest responder has approximately 2,500. The average number of staffed beds was 982 with a median of 581. The majority of the responses came from public, non-profit organizations.

Table 1 provides the summary results. All of the organizations who responded (n=7) have begun to seriously address the issue of duplicate records (Table 1). One of the healthcare organizations began addressing the issue in 1994, while others did not begin their investigations until after the year 2000. Several of these organizations noted that they have increased efforts after the implementation of their EHR, or after massive MPI cleanup efforts.

Survey Question	Yes	No	In Process
Have you migrated from paper, or are you in the process of migrating to electronic records?	2	0	5
Has your organization identified an acceptable level of duplicates?	2	4	1
Has the EHR changed your perception of duplicates?	5	2	n/a
Do you have a specific committee responsible for oversight of duplicates?	3	4	n/a
Have you begun to seriously address this issue?	7	0	n/a
Do you have an electronic algorithm system to search for duplicates?	7	0	n/a
Have you done any training with your staff to reduce duplicates?	6	1	n/a
Do you have any systems that create duplicates?	4	3	n/a

Table 1. Summary results of quantitative questions.

Out of the seven surveys received, only two had identified an acceptable level of duplicate records (Table 1). Among those who had not identified an acceptable level of duplicates, one noted that they are in the process of determining this level and another stated that "any duplicate is one too many." The first organization who identified as having established an acceptable level of duplicates reported it as being 1.85% in the entire MPI, with a daily creation rate of 5.5%. They also report that these are promptly addressed within 1 to 5 days. The other organization reports their acceptable level to be 0.02%.

Five of the seven responders stated that the EHR has changed their perception of duplicates (Table 1). Of those who responded in the affirmative, three noted that it has made duplicates easier to find. Another response was that the EHR has made the problem of duplicates more complex. The remaining organization noted that they have realized that a duplicate is better than a comingled record where two patients have been erroneously merged together.

Almost half of the organizations have named a specific committee that is responsible for duplicate record oversight (Table 1). They listed the names of the committees as the Data Integrity Steering Committee, Data Systems Workgroup, and Performance Management and Improvement. The other four stated that they do not have a specific committee, but instead used a cooperative effort of their IT and registration staff when needed.

Six of the organizations try to reduce duplicate record creation recurrence by providing feedback to the employees/supervisor after identifying the source of the duplicate creation. Out of the six who provide feedback, only one mentioned that they provide additional training. The remaining hospitals stated that they identify the source, and investigate patterns in duplicate creation in order to implement a solution, but do not specifically mention training or feedback as part of that solution. When asked directly whether or not they have trained their staff on the prevention of duplicates, six responded yes, while one said no but is intending to do so (Table 1).

When asked whether or not the organization had successfully migrated from paper to electronic records two responded “yes”, and the other five are “in process.” When asked what impact the migration had on duplicate records, two responded that it increased them while one reported that there was neither an increase nor decrease. Two responded they had to do a large clean-up of their MPI and EHR. Another organization stated that the migration has made duplicates easier to identify. The final respondent stated that since the providers are now searching for records as opposed to HIM staff, it makes it more likely they will be unable to locate correct records.

The next question related to the perceived impact of duplicate records on the EHR and patient safety. Six of the survey responders mention that there is a potential for providers to miss important patient information. One stated that it made it more difficult to prevent unwanted patient outcomes. Others mention that there is also potential for duplicate orders and billing, erroneous documentation, and patient frustration. One participant admitted that

patient safety events have occurred due to duplicate records created in the Emergency Department when unresponsive patients have been issued a new MRN. Despite the excellent example, they did acknowledge that this problem also existed when they were on a paper system. Additionally, it is also noted on one survey that duplicates complicate patient look-up by adding more records for the end-user to choose from and decrease the validity of reports run from the EHR

There is some discrepancy in the way that duplicate medical records are counted in the Twin Cities area. While all 7 healthcare facilities report counting a duplicate record pair as one, only two consider multiple duplicates to be one. Three other organizations count them separately, and two either have not found this or report it is a rare occurrence.

The majority of hospitals agree that there are multiple areas responsible for the minimization of duplicates increasing the total number of responses from 7 to 10. The majority (5) place the responsibility on the admissions and registration areas. Three also listed their Health Information Management (HIM) and Information Systems (IS) teams as being responsible. Only two organizations responded that they had Enterprise Index Coordinators (EIC) or Enterprise Master Patient Index (EMPI) teams who are responsible for the duplicates.

All of the organizations reported a similar process for the location and merging of duplicates. However, only three of the seven organizations noted that they also provide some sort of feedback to the departments. One of those three relies on an auto-notification system to alert departments to update their records after a duplicate has been merged. The other two contact the person who created the duplicate to provide feedback to the employee directly. While the majority does not consider the provision of feedback to the employee/supervisor as part of the reconciliation process they do use it as a method to prevent recurrence.

All of the healthcare organizations reported having an electronic algorithm system to check for duplicates. However, only 5 of those run the check daily. The other two run it weekly, or monthly (except in the lab).

According to the survey results, the most duplicates are created in the Emergency Department and in the Registration/Appointment process. A small number (n=2) also responded that they are created most often in their outpatient services. Additionally, four of the organizations reported that they have systems that create duplicates (see table 1). For example, one has interfaces with legacy systems that cause duplicate

creations while another has two different registration systems that interface. One of the three that reported they have no systems that create duplicates mentioned they had resolved that issue.

All seven healthcare organizations list name and date of birth as two of their primary unique identifiers. The next most popular identifiers were social security number and address (n=5), with three also using phone number. Medical record number, parents or next of kin, and patient signature are used by two organizations. Only one organization reported using sex of the patient as an identifier after experiencing an error where a patient was registered under her husband's name.

Discussion

Based on the survey responses and the background research we have compiled the following recommendations for dealing with duplicate records.

- 1.) Identify the source (human or system) of the duplicates.
- 2.) Establish an acceptable level of duplicates for your organization.
- 3.) Run daily reports.
- 4.) Establish a committee responsible for tracking the level of duplicates and ensuring they are addressed appropriately.
- 5.) Establish a timeframe for the location, validation, and potential merge of the duplicates.
- 6.) Ensure that there is a complete auditing trail to track the process of duplicate merges.
- 7.) Provide regular feedback to end-users and supervisors when duplicates are created.
- 8.) Provide continuing training to end-users to prevent creation in registration. Examine the issue of annual competency tests for registrars.
- 9.) Examine the systems that create duplicates (if any) and begin searching for solutions to either prevent or recognize them faster.
- 10.) Increase the number of identifiers required to register a patient.
- 11.) Establish an EMPI.

If necessary, organizations can contract with an outside company for a de-duping procedure. Considering the cost, it would be imperative that preventive measures have been implemented prior to the process. This will ensure that the organization does not have to continue to de-dupe their systems.

It is highly recommended that the organization continually monitor the level of duplicates being created. The idea is to reduce or maintain, and never

increase. Sudden increases in the number of duplicates could be indicative of a larger problem, such as the iSoft program that caused the duplicates to be created in Manchester.

Another important issue that needs to be constantly addressed is the amount of feedback and training provided to the end-user and the supervisor. Employees will continue to make the same mistakes and create duplicates if they are not properly notified in a timely manner and trained on how to prevent creating them in the future.

According to AHIMA, the issue of duplicates is even important to address as a healthcare organization moves towards a fully electronic system¹. Computerized algorithms are only the first step in the potential identification of a duplicate. These cases should be fully investigated by using the physical records in addition to the electronic until the whole system is paperless.

The issue of patient identification should also be explored. Some hospitals are beginning to use biometric technologies to identify their patients. Lourdes Hospital in Paducah, Kentucky began using fingerprint technology in the last decade⁶. According Gary Wood, the hospital IS director, they can "positively identify patients while eliminating duplicate records and reducing insurance fraud."

Limitations

The purpose of the survey was a fact-finding mission. Since it was the first survey of this nature in the Twin Cities, the questions were better suited as being qualitative. By allowing the survey participants latitude for free text responses we had hoped to glean additional information. However, after reviewing the responses to some of the questions it was discerned that some of the questions should have been clearer and additional questions asked.

When asking the healthcare organizations if they used an algorithm system to check for duplicates they all answered yes. However, we think the question should have asked about the location of their algorithm system. For example, is the algorithm embedded in the registration process and/or run as a batch process overnight? It would also have been appropriate to discern whether or not the algorithm is home grown or part of a commercial software system.

Another question that would have been excellent to ask in addition to their acceptable level of duplicates would have been their duplicate rate creation. It would be informative to compare organizations on statistics such as how many dupes they create daily, monthly, and yearly. This information would have

been useful in determining who had the highest rate of duplicate creation and the source of that creation whether human or system.

The point of care when the duplicates are merged is also another key question that should have been asked. It is assumed that most organizations would not risk merging duplicates prior to discharging the patient due to the potential to insert error into existing orders. This is an important issue to explore since it would require a clinician to recall that the patient information is across multiple records and to access these before making any decision. Either that or the clinician would have to make decisions on partial information for the entire episode of care.

Conclusions

As defined by the Minnesota Alliance for Patient Safety, the ultimate goal of this survey was to favorably impact patient safety⁵. I feel that through the participation of the majority of the community we have had the opportunity to learn new strategies and make recommendations that will hopefully favorably impact patient safety. The results of the survey were disseminated to all of the survey participants and will hopefully help the organizations further implement strategies to resolve the issue of duplicate medical records. In addition, I feel that further research on duplicate records is warranted considering the emphasis that Twin Cities' healthcare organizations are beginning to place on the issue.

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