How HIM Can Ease the Pain of Medical Errors

by Valerie J.M. Watzlaf, PhD, RHIA, and Diane Lares, PA-C, MBA

From patients to providers, medical errors are on everyone's mind. In this article, you'll learn how HIM professionals can stop medical errors before patients are harmed.

The last thing a sick patient expects from a healthcare provider is further discomfort. So patients and providers alike were stunned to learn how often the cure is worse than the disease in the National Academy of Science's Institute of Medicine Report (IOM), "To Err is Human: Building a Safer Health System."[1]

Although there has been considerable debate about the actual number of medical errors committed, there is general agreement that the healthcare industry needs to focus on error prevention. Patient safety programs have moved to the forefront of just about every hospital's quality or risk management program since the IOM report.

Major or "active" medical errors, such as medication overdoses, allergic reactions, or wrong limb amputation, are horrific cases that make headlines. But equally important are "latent" medical errors, which don't immediately harm patients. HIM professionals may see those errors—omissions in medical records or illegible prescriptions—on a daily basis.

The IOM study argues that latent errors pose the greatest threat to safety in a complex healthcare organization for two reasons. First, these "accidents waiting to happen" can go unnoticed for long periods of time and second, they can lead to multiple types of active errors. Further, latent errors are especially prevalent in complex organizations and are often accidentally built into the design of the healthcare process.[2] Finally, if healthcare professionals focus only on responding to active errors, latent errors may remain in the system like time bombs, making the system more prone to future failure.

How can HIM professionals work toward detecting latent errors and therefore preventing future active errors? Below, we'll examine some examples of common medical record errors—key omissions and illegibility in the medical record—and how HIM professionals can reduce the potential for error. In many cases, electronic medical records (EMR) can function as an important ally in the battle against medical errors.

Something's Missing: Medical Record Omissions

Latent error: Omission of height and weight. A patient's height and weight taken the day before breast cancer surgery is not recorded on the anesthesia record.

Potential active error: An under- or overdose of anesthesia, which may lead to complications during surgery, disability, or death.

In a study aimed at linking obesity and breast cancer recurrence in post-menopausal women, researchers found that data items such as occupation, menopausal status, height, weight, estrogen receptor values, progesterone receptor values, stage of tumor, tumor size, number of positive nodes, family history of cancer, and tumor status were not always documented in the medical record or cancer registry abstract for African-American women diagnosed with breast cancer.[3] Patient height was not recorded in the medical record 15 percent of the time, while weight was not recorded in the record 9 percent of the time.

Other important data items such as tumor size, TNM (tumor, node, metastases) stage, number of positive nodes, and family history of cancer were not recorded 14 percent, 18 percent, 24 percent, and 46 percent of the time, respectively. Data items essential to prognosis and treatment, such as estrogen receptor and progesterone receptor values, were not recorded 36 percent and 42 percent of the time, respectively. Without these data items, the potential for error during treatment grows.

HIM response: The HIM professional is a key player in reducing the omissions in the medical record. For paper-based records, standardized medical record forms should be designed and education on the importance of completing the entire form should be provided to clinicians using the forms. Also, concurrent record analysis should be performed so that omissions are flagged immediately and the clinician is able to complete the data while the patient is still in the hospital.

If ASTM or HL7 standards are used before the development of the electronic medical record, many of the key data elements would be flagged so that clinicians would be prompted to document those data elements. This would reduce the amount of missing data and lead to a comprehensive medical record that would decrease the potential for healthcare error.

Latent error: **Omission of discharge instructions.** Discharge instructions are not recorded in the medical record and are not given to the patient upon discharge.

Potential active error: Upon return to home after discharge, the congestive heart failure (CHF) patient does not correctly take the heparin prescribed for prevention of deep vein thrombosis (DVT). The patient develops DVT and is readmitted within three days of discharge.

According to a study on the efficacy of a clinical pathway in older patients with CHF, the patients on the pathway had significant reductions in length of stay and cost of care.4 However, mortality rates did not change and readmission rates showed a significant increase from 9.3 percent to 13.5 percent. A number of factors are associated with higher readmission rates, including premature discharges, sicker patients, comorbidity, inadequate discharge plans, and lack of basic patient education about CHF included in discharge instructions.

However, according to results of the Harvard Medical Practice Study II, a study of adverse events in hospitalized patients, inadequate follow-up of medication therapy, which is part of discharge instructions, occurred 45 percent of the time and made up the highest percentage of error for any error categorized under drug treatment.5 It is unclear whether omissions in discharge instructions in the medical record add to the active error of increased readmission rates.

HIM response: The HIM professional must think of creative ways to ensure that discharge instructions are documented and given to patients. Also, educate the clinician about the importance of discharge instructions, and how, if not carefully documented and recorded for the patient, they can lead to an active error. The HIM professional's responsibility may also include standardizing the discharge summary so that there is space for the clinician to record all aspects of discharge instructions.

If an EMR is used, the record could be structured so that if one part of the discharge instructions is not documented, the clinician could not move on to another area without completing it. If it is a paper-based system, thorough and accurate concurrent chart analysis in flagging these omissions could deter a patient from leaving the healthcare facility without appropriate discharge instructions.

System Breakdown

In a study on adverse drug events, researchers documented 334 errors that could be classified into 16 major system failures (see "System Failures and HIM Strategies for Improvement,").22 Seven system failures accounted for 78 percent of the errors. The most frequent systems failure (29 percent) was in the dissemination of drug knowledge, especially to physicians. In these cases, continuous education of physicians and others can alert the physician to the issues related to prescribing medication. Given that there has been a 500 percent growth in new medications within the last 10 years, this information is essential.

But how can the HIM professional help? The HIM professional should be part of the team that designs and develops information processes that provide the necessary information at the point of care. The HIM professional should also take the lead on investigating new technology, standardization of formats, and supporting a non-punitive atmosphere for medical errors.

Latent error: **Omission of medication information.** Patient is allergic to Digoxin but it is not listed in the medical record.

Potential active error: Patient is administered Digoxin for atrial fibrillation and develops an adverse reaction.

The accuracy of medication histories in hospital medical records came under scrutiny in a study that assessed 122 patients over the age of 65.6 The authors compared the written medical record to a structured history obtained directly from the patient. Overall, 83 percent of patient records had at least one error and 46 percent had three or more errors (an error was defined as either failure to record use of a medication or recording a medication that was not used). When data was reanalyzed to exclude over-the-counter, topical, and cold medications, 60 percent of all records still had at least one error and 18 percent had three or more errors.

The Harvard Medical Practice Study II also revealed errors in dose or method of use for drug treatment (42 percent), failure to recognize possible antagonistic or complementary drug-drug interactions (8 percent), and the use of an inappropriate drug (22 percent).7

When the accuracy of medication records in the EMR of an outpatient geriatric center was assessed, researchers found that 83 percent of medication records represented the compound, dose, and schedule of a current medication correctly and 91 percent represented the compound correctly.8 Almost four current medications per patient were missing but the principal cause of error in 31 percent of the records was the patient, who misreported or changed medications. In 26 percent of the errors, the errors could be attributed to the inability to collect changes to medications made by other clinicians. Transcription errors were found only 8.2 percent of the time. Though still present, there were fewer medication errors in the EMR.

In the past, many hospitals' allergy detection processes involved writing the patients' allergy histories in many places in the medical record, including at the top of the order sheet.9 In some facilities, the pharmacy entered the allergy information into its database based on what was recorded in the orders and medical record. However, the information was not shared from inpatient to outpatient or from admission to admission. According to a study on the use of technology to reduce medical errors, it was found that 33 percent of orders were written for patients who were allergic to that medication. Many of these systems have since been replaced with one in which all allergies are in one central location, drugs are mapped to "drug families" like penicillin, medication information is retained, and data checks are done by the information system.

HIM response: The HIM professional should be part of a team that works towards investigating the effectiveness of an EMR system in reducing the error potential for missing allergy and medication omissions.

Latent error: Lab tests not included on patient record. Physician cannot locate lab test to support or refute a diagnosis ofappendicitis.

Potential active error: Patient returns home and is readmitted within one day with severe pain and complications from a ruptured appendix.

In the Harvard Medical Practice Study II, errors of omission included failures to use indicated tests (50 percent of the time) or act on results of tests or findings (32 percent), failure to take precautions to prevent injury (45 percent), and avoidable delays in diagnosis (55 percent).10 Also, these errors were often classified as negligent. It's unclear, however, if these errors of omission are due to an event similar to the scenario above. More research is needed to determine which errors of omission are due to omissions in documentation in the medical record and/or missing reports. According to a systems analysis of adverse drug events, the lack of patient information, such as the omission of laboratory tests as described above, was associated with 18 percent of errors.11

Also, a study supported by the Agency for Healthcare Research and Quality found that feedback from an EMR helped primary care physicians improve their management of depression.12 When a patient was identified as having major depression by a computerized mood module, primary care physicians were notified via electronic mail alert and letter. The physician was asked to state if he agreed, disagreed, or was unsure of the diagnosis. The study revealed that physicians were less likely to ignore the electronic messages and those who agreed with the depression diagnosis sooner were more likely to document depression in the medical record, prescribe antidepressant medication, and refer the patient to a mental health professional. The impact of using an EMR and online reminder system may have a direct impact in reducing errors related to delay in diagnosis and treatment especially for patients with depression.

HIM response: Again, the HIM professional is a very important part of the healthcare team in developing systems that decrease the potential for missing information such as lab data. It has been demonstrated that EMR systems are effective in

decreasing the delay in diagnosis but how they are designed and developed is vital. The expertise of the HIM professional is essential.

System Failures and HIM Strategies for Improvement	
System Failure	HIM Professional Strategy
Drug knowledge dissemination	Enhance the knowledge as a team member and participate in knowledge bases that are close to the point of care
Dose and identity checking	Bar code system
Patient information availability	Documentation formats and use of standardization that provide patient information in a user-friendly and intuitive way
Order transcription	Computerized physician order entry
Allergy defense	Allergy information prominence and access tested and tracked; automatic prompts within the documentation and administration process
Medication order tracking	Proper procedural cross-checks and computerized patient orders with bar code systems (if highly reliable)
Interservice communication	"High alert" and non-punitive approach to latent errors; the HIM professional brings issues forward as appropriate. The system needs to adapt to become a learning organization

Can't Read It: Illegible Record Entries

Latent error: Illegible medical record entries. Specific medical record entries including adverse conditions are unreadable, so patients can't receive insurance benefits.

Potential active error: The patient is not treated appropriately for the adverse conditions and cannot return to work.

In *Manso-Pizarro v. Secretary of Health and Human Services*, the claimant, alleging that heart conditions, high blood pressure,and bad circulation prevented her from working, needed to receive Social Security Insurance benefits.[13] Due to illegibility of important parts of the medical record, including a discharge summary and other adverse conditions, the administrative law judge could not conclude that the claimant was unable to perform her prior job. Therefore, additional evidence of functional ability had to be sought from another medical expert. This case demonstrates how illegibility of the medical record delayed treatment for this patient and hampered her ability to receive disability insurance benefits.

Other prominent healthcare officials also cite paper records' inaccessibility and nonportability as limitations.[14] For example, in an article about Medicare claims, an ophthalmologist argued that 58 percent of the medical records in any ophthalmic practice have inaccuracies and cited illegibility as the primary reason for these inaccuracies and for conducting Medicare audits.[15]

HIM response: The HIM professional should strive to reduce the number of handwritten entries in the medical record. Essential reports, such as discharge summaries, should not be handwritten and the HIM professional should work toward establishing effective dictation and transcription systems in their facilities. The HIM professional should continue to flag illegible entries and make administrative personnel aware of the potential for error with every illegible entry that is recorded.

Latent error: Illegible medication orders and prescriptions. Medication orders and prescriptions cannot be deciphered because of physicians' poor handwriting.

Potential active error: Patient is administered the wrong medication, develops an adverse reaction, and dies.

During an FDA workshop on minimizing medical product errors, speaker Bruce Lambert noted that the most common kind of medication error is due to illegibility of prescriptions.[16] Pharmacists and nurses misinterpret or are unable to decipher

physician's handwriting and administer the wrong medication as a result.

HIM response: To minimize errors, Lambert recommends the following prevention techniques:

- don't use phonologically similar drug names
- if available, use short names instead of long names
- do not store drugs in alphabetical order
- eliminate handwritten and especially handwritten faxed prescriptions
- use bar codes
- add the dose and indication of new drugs

An Institute of Safe Medication Practices (ISMP) white paper includes an example in which a physician prescribes Avandia, a diabetes drug, and because of poor handwriting, it is read as Coumadin, a blood thinner.17 Pharmacists struggle to interpret dosing instructions on prescriptions due to not knowing whether a zero is preceded by a decimal point. If the dose is illegible, it could cause a major overdose and possibly lead to serious injury and death.

Latent error: Confusing abbreviations. Physician hand writes q.d. (every day) but it is misinterpreted as q.i.d. (four times per day).

Active error: This error quadrupled the patient's dose and caused serious complications in his healthcare as well as increased length of stay in the hospital.

As illustrated in "ISMP's Dangerous Abbreviations,", several troublesome abbreviations can be misinterpreted.18

HIM response: The HIM professional should share information contained in the ISMP table with clinicians and work with them to institute policies that would eliminate the use of these abbreviations.

From Grocery Stores to Bedsides?

Bar code technology has been widely used in non-medical environments. In healthcare, bar codes can create a direct link between the right medicine and the right patient with the added advantage of automated billing. Already, the National Coordinating Council for Medication Error Reporting and Prevention adopted recommendations for promoting and standardizing bar coding on medication packaging.23 And according to ISMP, less than one percent of hospitals have fully implemented bar codes.24 One of the downsides is the technology's unreliability: sometimes the bar code on the patient's wrist band can't be read, which increases the potential for errors.

The HIM professional should be part of a team to assess the possibility of bar coding for medication administration within their facility. There may be drawbacks to the bar code system; however, the team should assess these against the many advantages and determine if the system truly decreases the potential for latent errors. If latent errors can be decreased, patient safety will be increased and the quality of care provided to the patient enhanced.

Latent error: Faxed orders. A physician's office faxes a patient's admitting orders to the hospital to provide communication until the physician arrives to perform the history and physical.

Active error: The graininess of the faxed order make the specific order unclear but the staff determine the patient should have medication. However, when the physician brings in the actual orders, the staff realizes they gave the patient an incorrect medication.

Handwritten faxes should never be used for medication orders because of potential problems interpreting the physician's handwriting as well as the inherent difficulty of reading faxes. At the FDA workshop, Lambert argued that faxed, handwritten prescriptions should be eliminated, while the ISMP's white paper, estimating that less than 5 percent of physicians use electronic means to prescribe medication, includes a plea to eliminate handwritten orders within three years.19, 20

HIM response: It is imperative that all HIM professionals work toward eliminating the potential for errors in the medical record. Instituting policies that fully support the elimination of faxed medication orders is a step in the right direction. Being part of a team that investigates the usefulness of bar coding is also an essential part.

Will Technology Come to the Rescue?

Many of the solutions to documentation errors are based in technology because of the ability to design menus, pick lists, and alerts that can cue the physician to proper medication dose and drug interactions and avoid the legibility and abbreviation issues. However, an organization that jumps quickly to technological solutions may overlook some of the causes of system problems that can still cause unintended error or even cause additional errors (such as the inability to verify the physician order). Keep in mind that technology must be applied to processes or pathways that make sense. Thorough analysis, simplification, and error proofing of the system design are the first steps in creating the environment for system improvement.

Further, this approach avoids a culture of blame for errors and instead fosters one that supports disclosing problems for root cause analysis and resolution. Redefining how your organization discovers and handles errors can lead to a significant decrease in errors. The Harvard Medical Practice Study II data revealed that more than two thirds of the injuries were preventable and considered an error related to management.21 Instead of blaming a person for an error, hold the system design responsible, which opens up communication and awareness of the latent errors before they become active errors (see "System Breakdown").

The dangers intrinsic to healthcare are too great to be managed after the fact. HIM professionals can contribute much-needed expertise in exposing potential problems before real harm occurs. While critical technology to reduce errors is still being developed, a core change must be made in the way the healthcare community finds and addresses errors and the systems behind them. Here, HIM professionals can make their mark.

Notes

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ISMP's Dangerous Abbreviations

The table below is an excerpt from the May 25, 2001, ISMP Medication Safety Alert. The complete table is available at www.ismp.org/MSAarticles/specialissuetable.html.

Abbreviation/ Dose Expression	Intended Meaning	Misinterpretation	Correction
D/C	discharge, discontinue	Premature discontinuation of medications when D/C (intended to mean "discharge") has been misinterpreted as "discontinued" when followed by a list of drugs	Use "discharge" and "discontinue"
DPT	DPT DEMEROL PHENERGAN-	diphtheria-pertussis-tetanus (vaccine)	Use the complete spelling for drug

	THORAZINE		names.
HCl	hydrochloric acid	potassium chloride (the "H" is misinterpreted as "K")	Use the complete spelling for drug names.
HCT	hydrocortisone	hydrochlorothiazide	Use the complete spelling for drug names.
HCTZ	hydrochlorothiazide	hydrocortisone (seen as HCT250 mg)	
MgSO4	magnesium sulfate	morphine sulfate	
MSO4	morphine sulfate	magnesium sulfate	
µg	microgram	Mistaken for "mg" when handwritten	
o.d. or OD	once daily	Misinterpreted as "right eye" (OD—oculus dexter) and administration of oral medications in the eye	
TIW or tiw	three times a week	Mistaken as "three times a day"	
q.d. or QD	every day	Mistaken as q.i.d., especially if the period after the "q" or the tail of the "q" is read as an "i"	
qn	nightly or at bedtime	Misinterpreted as "qh" (every hour)	
qhs	nightly at bedtime	Misread as every hour	
q6PM, etc.	every evening at 6 p.m.	Misread as every six hours	
q.o.d. or QOD	every other day	Misinterpreted as "q.d." (daily) or "q.i.d." (four times daily) if the "o" is poorly written	
sub q	subcutaneous	The "q" has been mistaken for "every" (e.g., one heparin dose ordered "sub q 2 hours before surgery" misunderstood as every 2 hours before surgery)	
SC	subcutaneous	Mistaken for SL (sublingual)	
U or u	unit	Read as a zero (0) or a four (4), causing a 10-fold overdose or greater (4U seen as "40" or 4u seen as "44"	
IU	international unit	Misread as IV (intravenous)	
cc	cubic centimeters	Misread as "U" (units)	
x3d	for three days	Mistaken for "three doses"	
BT	bedtime	Mistaken as "BID" (twice daily)	
Name letters and dose numbers run together (e.g., Inderal40 mg)	Inderal 40 mg	Misread as Inderal 140mg	
Zero after decimal point (1.0)	1 mg	Misread as 10 mg if the decimal point is not seen	
No zero before decimal dose (.5 mg)	0.5 mg	Misread as 5 mg	

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