Assessing and Improving EHR Data Quality (Updated)

Editor's Note: This practice brief supersedes the March 2007 practice brief "Assessing and Improving EHR Data Quality."

QUALITY HEALTHCARE DEPENDS on the availability of quality data. Poor documentation, inaccurate data, and insufficient communication can result in errors and adverse incidents.[1] Inaccurate data threatens patient safety and can lead to increased costs, inefficiencies, and poor financial performance. Further, inaccurate or insufficient data also inhibits health information exchange (HIE), and hinders clinical research, performance improvement, and quality measurement initiatives. The impact of poor data on care is only increased by the implementation of ICD-10-CM/PCS, the "meaningful use" EHR Incentive Program initiatives, and the introduction of payment reform models such as accountable care organizations (ACOs)—all of which emphasize the need for more specific and meaningful data collection, sharing, and reporting.

A meaningful electronic health record (EHR) improves the ability for healthcare professionals to enact evidence-based knowledge management and aids decision making for care. EHRs can have a positive impact on quality of care, patient safety, and efficiencies. However, without accurate and appropriate content in a usable and accessible form, these benefits will not be realized.

This practice brief discusses the challenges of maintaining quality data in the EHR and offers best practice guidance for ensuring the integrity of the healthcare data. It is designed to support and guide organizations, health information management (HIM) professionals, and providers to better assess, improve, and support the management of electronic health information.

New Focus on Data Capture Required

The ability to share electronic health information both internally and externally with healthcare organizations has been accepted as a method to improve the quality and delivery of care.[2] Data integrity is critical to meeting these expectations. A single error in an electronic environment presents a risk that can be magnified as the data transmits further downstream to data sets, interfaced systems, and data warehouses.[3] Accurate data leads to quality information that is required for quality decision making and patient care.

The quality of data contained in an EHR is dependent on accurate information at the point of capture—the data source. Clinical documentation also plays a key role in data quality. Clinical documentation practices need to be developed and standardized to facilitate accurate data capture and encoding. In an EHR, it is imperative these content standards are built into the fiber of decision making screens, templates, drop-down lists and other tools for documentation.

Additionally, establishing consistent data models will assure the integrity and quality of the data maintained in the EHR. Standardization of data definitions and structure for clinical content (including smart text)—and quality checkpoints, along with traditional auditing procedures—help ensure quality data is captured. Productivity and effectiveness of new tools such as natural language processing (NLP) and computer-assisted coding (CAC) can be enhanced when these controls are in place.

AHIMA's Data Quality Management Model discusses the business processes that ensure the integrity of an organization's data throughout the information lifecycle, during collection, application, warehousing, and analysis.[4] This model is available online in AHIMA's Body of Knowledge at www.ahima.org.

Ensuring Data Accuracy

The EHR is a compilation of clinical and clinically related information and is used as the primary communication tool for planning and delivering patient care. Quality patient care and safety improvement goals can be enhanced and better achieved through the application of documentation guidelines and data standards. The quality of the documentation in the patient record is contingent upon the accuracy and completeness of information entered into the record by all parties involved in the patient's care.

Documentation and data content within an EHR must be accurate, complete, concise, consistent, and universally understood by data users, and must support the legal business record of the organization by maintaining these parameters. It is critical that both structured and unstructured data meet a standard of quality if they are to be meaningful for internal and external use, such as for continuum of care and secondary purposes. Factors such as ease of use and design can facilitate adherence to documentation guidelines and standards.[5]

Documentation policies and guidelines must be established in compliance with governmental, regulatory, and industry standards—including those for accuracy, timeliness, and copy functionality—and should apply to paper and electronic formats. Strong facility controls and governance can help ensure documentation guidelines are followed and compliance requirements met. For example, consider the varying use of ab-

breviations across facilities and states. The phrases below all have the same abbreviation, but mean very different things:

- AKA—"above the knee amputation" OR "also known as"
- ABG—"aortic bifurcation graft" OR "aortobifemoral graft"
- ASCVD—"arteriosclerotic cardiovascular disease" OR "arteriosclerotic cerebrovascular disease"
- CHD—"congenital heart disease" OR "congestive heart disease" OR "coronary heart disease"
- DOA—"date of admission" OR "dead on arrival"

It is imperative that abbreviations are used in the same manner throughout documentation so that the patient is treated accordingly.

Data Quality Best Practices

To further assist the industry in the combined goals of improving quality of care and ensuring the financial integrity of the organization, the following best practices for ensuring quality healthcare data are recommended. An accompanying illustrative case study is included in "Appendix A: How One Hospital Improved Healthcare Data Quality in its EHR" in the online version of this article in the AHIMA Body of Knowledge, available at www.ahima.org.

Role-based access to the data—sometimes referred to as create, read, update, and delete authority—must be defined, enforced, and built into system security functionalities. Clear policies on what information access is needed by a specific role or relationship to patient types must be developed. For example, only staff who work in the psychiatric clinic would have access to those patients seen in that clinic as opposed to enterprise-wide patient access. This is determined by the role and location of staff. Typically the HIM professional identifies the roles and what access is given based on HIPAA minimum necessary, which states that staff should only have access to the information they need to do their job.

A **data dictionary** exists for each information system, with standard data field definitions for each data element. These definitions should be clearly communicated to all staff accessing the record—especially those responsible for reporting EHR data. In addition, periodic validation of access needs to be in place. The data dictionary can also be built into system functionalities to ensure adherence on many levels.

For example, the distinction between ethnicity and race should be understood and consistently applied during the registration process. Selection options for these fields should be limited to choices that are in adherence with the data dictionary. EHRs are comprised of many different technologies, although there may be many modules purchased together from one vendor to create an EHR.

For all of these systems that feed the EHR, clear policies, standards, procedures, and functionalities should be established to define who owns and has responsibility for maintaining and creating the data dictionary for each system and module. Having a single owner over the various dictionaries is helpful in reducing reporting errors. The consistent capture of key data, whether demographic or statistical, is crucial.

A **standardized format** is used to ensure consistency. For example, to satisfy meaningful use requirements the problem list is developed using SNOMED CT to record current, active, and past diagnoses. Additionally, the use of standardized templates and online forms should be required to the greatest extent possible for provider documentation. This too can be built into the functionality within a system, but should be developed with the appropriate key stakeholders and with compliance input.

Use of **structured data** is important to enable the sharing and exchange of health information with HIEs and other organizations. For example, consider entering information such as vital signs as discrete data into correctly formatted fields, versus allowing free text entry of the vital signs into the system. No matter what system you enter a temperature or blood pressure, the format is always the same and can be more easily shared across systems. If the information was entered as free text, the formatting might be lost and the information misinterpreted.

State and federal laws and regulations; accreditation standards; medical staff bylaws, rules, and regulations; and organizational policies and procedures mirror standardization decisions and should be followed by designated staff. The Joint Commission's Information Management and Record of Care standards, Health Insurance Portability and Accountability Act (HIPAA) standards, Centers for Medicare and Medicaid Services' Conditions of Participation, and Federal Rules of Civil Procedure related to electronic discovery are just a few of the standards that should be kept in mind when developing one's own facility standards and procedures.

Data integrity policies and procedures must be followed. These policies may include (but are not limited to) registration processes, standards for handling duplicate records, and processes for addressing overlays. It is important to implement policies and procedures to maintain the integrity of the data throughout the patient encounter for all information entered into the EHR, whether by people or systems. Individuals dedicated to the continuous auditing and EHR correction processes that monitor the system proactively and correct errors as they are identified play an important role in fine-tuning processes and ensuring the overall quality of the data.

Awareness Factors for EHR Data Quality

In order to fully leverage the potential of an EHR system's ability to improve data quality, and to understand the limitations a particular system might have, it is imperative that an HIM professional have a thorough understanding of their specific EHR system functionality as well as a broad understanding of EHR functionality in general.

Data strategies and an effective data quality program that incorporate data integrity processes must be in place to ensure optimal data quality.

Some areas to consider addressing in an overall plan for data quality monitoring and improvement include:

Patient Identification

Ensuring that health information is associated with the patient to whom it pertains is key to ensuring patient safety. EHR systems should have alerts and prompts that notify the user when the potential for an incorrect association exists. For example, the EHR system should alert users when several patients have similar names and dates of birth, such as in the case of multiple birth siblings. Access controls that strictly limit who can enter and update or change key enduring demographic elements (such as name, date of birth, or place of birth) must also be in place. Capabilities to limit medical identity theft must also be implemented.

Simply matching demographic information supplied by the patient is not sufficient. Additional identifiers or biometrics, such as patient photographs, palm vein scanning, or fingerprinting should be utilized when possible. Standardized naming convention policies or formats for using the patient's legal name must also be developed and employed (i.e., standardizing the spelling of suffixes such as "Jr.," "Junior," and JR) to help minimize the risk for error. Policies and procedures for baby naming, for unidentified emergency patients, for the use and exclusions of hyphens, and for handling celebrities or notable individuals (and the additional complication of considering whether to use an alias for the patient) should also be developed.

Thorough training for all front-end users—especially those in registration and scheduling roles—and proactive surveillance by data integrity analysts for any patient identification errors should be given the utmost attention to ensure proper patient identification.

Copy Functionality

Use of copy functionality (also known as "copy/paste," "copy forward," or "cloning") can ease clinician workflow and improve the consistency of static health information, such as past medical history. But when misused, copy functionality can lead to redundant, misleading, inaccurate, and nonessential documentation that may jeopardize quality of care and lower the narrative quality of the data. The ability to limit copy functionality in an EHR system is vital for the accuracy of data. Limitations of copy functionality must include measures such as:

- Clearly labeling the information as copied from another source
- Limiting the ability for data to be copied and pasted from other systems
- Limiting the ability of one author to copy from another author's documentation
- Allowing a provider to mark specific results as reviewed
- Allowing only key, pre-defined elements of reports and results to be copied or imported
- The ability to monitor a clinician's use of copy and paste

Most EHRs have not addressed these needs completely. Therefore, specific facility policies and procedures are important to implement. More information on policies and procedures related to copy functionality can be found in AHIMA's "Copy Functionality Toolkit", available through the AHIMA Body of Knowledge at www.ahima.org.

Corrections and Amendments

Policies must outline who may amend records, when record amendments can be made, and how records may be amended. Each organization may develop specific guidelines that outline what the HIM staff may amend versus what must be sent back to the provider for correction. For example, HIM staff may be allowed to change demographic data such as a date of birth upon verification, but all clinical amendment requests must be sent back to the provider for updates.

Regardless of the type of change, any amendments to the content of the health record must be approved by the provider. For more information on policies and procedures related to corrections and/or deletions, view AHIMA's "Amendments in the Electronic Health Record" toolkit, available in the AHIMA Body of Knowledge at www.ahima.org.

Standalone Devices

Whenever possible, information from standalone devices should be incorporated into the EHR. However, certain devices or equipment that contain health data might not interface with the EHR. The lack of availability of health information contained in standalone devices can potentially impact data quality by restricting certain types of data from view or making the viewing of data difficult. In such cases it is important to assess what standalone data is not integrated into a single EHR view and ensure those who have a need to know such information have the ability to access it.

Organizations must closely monitor standalone systems to ensure data quality and accuracy between the EHR and the standalone system. For example, scanning results into a document imaging system for viewing, or possibly embedding a link from the EHR directly to the standalone system, may be considered to ensure that all the data is available when needed. Having information in disparate systems with no link or viewing ability could lead to patient safety concerns.

Legacy Systems

Many organizations have legacy systems that contain patient information or that feed information into the current EHR. Prior to retiring a legacy system, a thorough assessment of data stored in the legacy system must be undertaken and a plan to transition required data elements must be developed. A legacy system may also feed data to an EHR or be retired via converting data into an EHR to eliminate system redundancy.

When errors in data are discovered, the error(s) must be corrected at the source as well as in any and all systems that contain the erroneous data. A clear policy and procedures for determining the source of truth when differences exist between interfaced systems is critical. This includes any legacy systems that have not been converted.

The HIM Professional's Role in Ensuring EHR Data Quality

THE HEALTHCARE INDUSTRY is made up of diverse professions that look at the issue of data quality from different perspectives. However all agree that quality data is critical for patient care and safety, reimbursement, accreditation, quality initiatives, and research. Yet, there has been little discussion about who in healthcare is responsible for ensuring data quality in the electronic environment.

In the past, the data quality role has fallen largely on HIM professionals as the custodians of the paper record. In the electronic environment, everyone from administrative and support staff responsible for specialty applications to direct caregivers who document inpatient records will be tasked with ensuring data quality. It is a break in tradition that each individual in the array of caregivers that treat and interact with a patient has a role in creating and maintaining quality data in the patient's record.

The importance of HIM contributions to development decisions cannot be overstated. HIM professionals will continue to be regarded as the data stewards, coordinating the multidisciplinary approach to EHR development and education. One design decision can potentially impact release of information integrity, regulatory compliance, and/or reimbursement denials due to inadequate documentation. These are not always factors clinicians will readily recognize. In addition, data entry now occurs in many different non-traditional forms (i.e., telephone encounters, patient portal messaging, e-mail, etc.), and all of these must find a place in the organization's legal health record. Maintaining integrity through an information governance plan is critical.

The Ripple Effect

In a networked environment, health record data affect a myriad of internal data sets, systems, and repositories as well as external databases, networks, and even personal health records. For example, consider when interfaces from one organization's EHR are interfaced with an affiliate EHR. Decisions on what data is brought into the main organization's EHR and whether the interfaces are bidirectional will have significant impact on how much auditing is needed by the data integrity team. Specifically, a patient name could change and inconsistencies occur if one organization uses the insurance card to validate their name and an affiliate uses the patient's driver's license. Ensuring the quality and integrity of the data moving through multiple systems has never been more important. EHR technology enables HIM professionals to improve the quality of patient care through influence over quality design and quality improvement functions.

The health record is progressing from paper to electronic at a time when attention to quality of care is intense. Traditional quality improvement programs, and new quality measurement initiatives and regulations have helped healthcare professionals focus on process and workflow. The Joint Commission and the Centers for Medicare and Medicaid Services survey approach have supplemented this focus on quality, with attention to record completeness. But a move to more point-of-care observation and documentation is needed. Other healthcare professionals are beginning to understand what HIM professionals have known all along—that the quality and integrity of the health record depends on the front-end collection of quality data.

An Evolving Role

The role of the HIM professional is evolving from managing the content of the health record to contributing to EHR data standardization and harmonization, both inside and outside their organizations. The future role of the HIM professional will involve the development of information governance programs, EHR quality models within the organization, and performing auditing and monitoring checkpoints. Audit programs will help identify points throughout the data collection process that are at risk. HIM professionals will facilitate resolution, through the effort of providing ongoing feedback and by taking a more active role in root cause analysis. EHR audits at the organizational level will provide valuable information for inter- and intra-organizational data harmonization efforts that affect health information exchange. HIM professionals can contribute positively to all these efforts through their understanding of the processes underlying the clinical and financial data streams that comprise the EHR. Many HIM professionals will continue to find a natural migration to leadership roles in technology departments or vendor environments to contribute their knowledge from another perspective.

HIM professionals have always worked to ensure that data in the health record meet quality standards such as those for accuracy, timeliness, consistency, and completeness. The ability to use these skills in the electronic environment elevates the importance of HIM engagement in auditing and monitoring documentation practices contributing to critical EHR design decisions, and discussions surrounding data output and reporting. Information governance functions and stewardship ensure the use and management of health information is compliant with jurisdictional law, regulations, standards, and organizational policies. As stewards of health information, HIM roles and functions strive to protect and ensure the ethical use of health information.[6]

HIM professionals can now leverage their knowledge in clinical content and EHR data quality to help organizations define governance programs and understand the front-end and throughput processes that create EHR data. The migration of healthcare records from paper to electronic puts HIM professionals in a unique position to lead efforts to evaluate and improve EHR data, which will be central to the acceptance of the EHR and the migration to a future state with new technologies and interoperability.

Hybrid Health Record

The move toward a more integrated EHR may be occurring in stages, due to the cost and significant impact a "big bang" implementation can have on an organization. This creates inconsistent methods for inputting documentation—with some living in the EHR and some remaining on paper. Providers locating documentation for patient care and other staff performing data review, data abstraction, and coding of services also face inconsistency in finding pertinent information. In such cases, a concise training plan must be established to clearly communicate and manage the data while in a hybrid state. O

Appendices

Two appendices are available in the online version of this practice brief in the AHIMA Body of Knowledge at www.ahima.org:

- Appendix A: Case Study—How One Hospital Improved Healthcare Data Quality in its EHR
- Appendix B: Ensuring Data Accuracy with Comprehensive Documentation

Notes

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