EHRs Serving as the Business and Legal Records of Healthcare Organizations (2016 Update)

Editor's Note: This update supersedes the November 2010 update, EHRs as the Business and Legal Records of Healthcare Organizations that combined information from the October 2004 Practice Brief "The Strategic Importance of Electronic Health Records Management" and the June 2005 Practice Brief "A Checklist for Assessing HIM Department Readiness and Planning for the EHR."

The healthcare industry has made significant progress in the quest for electronic health records (EHRs), which have improved the quality and safety of patient care and assisted in achievement of real efficiencies in the healthcare delivery system. EHRs have been essential to better clinical integration and health information exchange. Accordingly, emphasis has been placed on the clinical aspects of EHRs that support the patient care process and decision making.

Well-designed EHR systems have:

- Improved the quality of care by enabling automated collection of data that supports quality measurement and reporting
- Increased operational efficiency and contained costs by streamlining clinical workflows and avoiding duplicate procedures
- Assisted with collecting data for secondary uses, such as clinical research, population and public health reporting, and fraud detection and deterrence
- Served as the foundation for health information exchange

From a strategic standpoint, however, it is important to look beyond the clinical uses of the information and develop a plan that ensures the health records and EHR system can support the healthcare organization's business and legal needs as well. The use of the EHR for business and legal purposes is every bit as mission-critical as its clinical uses and must be reflected in approaches to its management. Because of the urgency healthcare organizations have felt to begin deploying EHRs, healthcare entities, vendors, and others sometimes neglected to build in the processes and system capabilities needed to enable optimal EHR management functions and ensure the electronic rather than the paper version could stand as the legal business record.

Like other essential healthcare organizational assets, clinical information within the EHR requires oversight in order to be used effectively for decision making, performance improvement, cost containment, and mitigation of risk. Applying sound information governance practices to EHRs can help ensure that the information that is captured and maintained within the EHR is consistently trusted and actionable.

The Health Level Seven EHR Records Management and Evidentiary Support (RM-ES) Project's EHR Functional Profile supplied conformance criteria that supports records management functionality and enables the EHR to be used as the legal business record of a healthcare enterprise. The profile identifies the key infrastructure functions that support the management of health records within the system for business and evidentiary purposes.[1]

Definition of EHR Management

EHR management (EHRM) is the process by which digital health information is created or received and preserved for evidentiary (i.e., legal or business) purposes.

EHRM requires planning and decision making for the entire life cycle of the information contained in EHR systems—from creation or capture, review, modification, and sharing through searching, tracking, preserving, retention, and, ultimately, destruction of the information that has been designated as health records of the organization or entity.

Decision making includes, but is not limited to, deciding which information to declare as the record of care (or identifying the legal health record), the assignments of authorities and responsibilities, the design and administration of the processes to ensure integrity, and the audit and review of the performance of those processes. Healthcare organizations must make critical decisions about the role and use of analog storage media, such as paper and film, in the early phases of EHR system development to avoid the dilemma of maintaining dual systems.

HIM Roles and Responsibilities in EHRM

HIM professionals must be involved with the adoption and implementation of EHRs and have the professional responsibility to guide these efforts to ensure that the EHR meets the functional requirements for a health record that can be used for business and legal purposes.

To guide HIM professionals, AHIMA's leadership models develop a comprehensive framework and suite of tools that include:

- Assuming a leadership role to establish organizational standards for EHR systems that constitute the record of care to ensure that such records meet legal and business requirements
- Establishment of policies and procedures for creating and maintaining the integrity of the legal health record throughout its information life cycle
- Identification of resources required to manage EHRs and systems, including required budget, staffing, technology, and processes
- Communication, education, and, when required, training regarding EHRM for users of the EHR
- Fostering stewardship among custodians of the technology and systems that constitute the EHR
- Development and implementation of audit, review, and other control processes that support the integrity of EHRs, enabling them to meet the business and legal needs of the healthcare organization

HIM professionals must take the lead in establishing organization-wide principles for electronic patient records and clinical documentation applications. Organizations must establish policies that identify the content that constitutes the legal health record and ensure that health records meet regulatory requirements. They must educate HIM staff on the practices and procedures that maintain record integrity.

As the traditional custodians of the paper medical record and medical record system, HIM professionals are trained to ensure the quality, privacy, and integrity of the EHR. Today, the EHR can and often does reside in several different information systems. HIM professionals ensure that information management and record of care standards are applied consistently across these various systems to maintain the level of integrity necessary for the healthcare organization's records.

HIM professionals have long been translators of clinical data for their business and financial offices using their expertise, understanding of documentation, and coding functions. Now is the time for them to share with healthcare consumers their knowledge as healthcare consumer advocates. The shift to a consumer-centric model requires HIM practitioners to educate and assist consumers in accessing secure patient information and translating medical terminology across the continuum of care and in advanced technologies.

The electronic environment requires HIM professionals to manage data and assist in the development of decision-support systems for individual, aggregate, and public health data. HIM practitioners have a tremendous responsibility to provide the support for organizational, local, and national systems that ensure quality, integrity, and availability of healthcare data. The role of the public health officer in providing strategic leadership for health information in the public health sector has been gaining importance. In fact, these activities are already under way and can be supported fully by the EHR.

Appendices

Although this Practice Brief provides an overview of the importance of strategic electronic document management, much supporting information is necessary to make a successful transition to the EHR.

EHR management requires decision making throughout the EHR's life cycle—through the processing, distribution, maintenance, storage, and retrieval of the health record to its ultimate disposition, including archiving or destruction. These

considerations are included in Appendix A, "Issues in Electronic Health Record Management" below. The scope of EHR management must include a determination of which EHRs to retain and for how long, the assignment of authorities and responsibilities, the design and administration of the process, the integrity of the data, the audit and review of the performance of those processes, how those data are protected and secured, and management of health information exchange.

The EHR has changed the overall approach to managing health information. One of the many important roles in this transition that HIM practitioners play is to provide leadership in ensuring that healthcare organizations are able to use the information generated by EHRs for legal and business purposes. Healthcare organizations must implement EHR systems that meet the requirements of a legal business record.

HIM departments may also reference Appendix B, "Checklist for Transition to the EHR," in preparation for going paperless. The checklist in Appendix B assists in the transition from paper to an EHR that will serve as the legal medical record for the healthcare organization. Whether paper or electronic, an organization's health information system must meet certain standards to be considered a legal business record. The checklist can help organizations and HIM departments prepare for going paperless and ensure that they can get rid of the paper after the EHR implementation is complete. The decision to go paperless involves having enough confidence in the electronic system to let go of a paper system, which requires ensuring that the electronic system handles amendments, corrections, authentication, backups, downtime, confidentiality, and printouts and reports for disclosure purposes.

Additional Reading

AHIMA. "Leadership Model: Legal Health Record."

Dimick, Chris. "Charting the Legal Health Record." *Journal of AHIMA* 78, no. 5 (May 2007): 30.

Dimick, Chris. "Legal Considerations in Joining an HIE." *Journal of AHIMA* 82, no. 10 (October 2011): 62-64.

McLendon, Kelly. "Creating a Legal Health Record Definition" *Journal of AHIMA* 83, no. 1 (January 2012): 46-47.

"SAFER Guides." HealthIT.gov.

Note

[1] Health Level Seven EHR Technical Committee. "Electronic Health Record-System Functional Model, Release 1: Chapter Five: Information Infrastructure Functions." February 2007.

References

AHIMA e-HIM Task Force. "A Vision of the e-HIM Future: A Report from the AHIMA e-HIM Task Force." 2003.

"HIM Professionals Vital in Transition to e-HIM." *AHIMA Advantage* 7, no. 6 (2003): 1, 3-4.

Appendix A: Issues in Electronic Health Record Management

Electronic health record management (EHRM) is the process by which electronic (e.g., digital) health records are created or received and preserved for legal or business purposes. EHRM requires decision making throughout the EHR's life cycle-through the processing, distribution, maintenance, storage, and retrieval of the health record to its ultimate disposition, including archiving or destruction. The scope of EHRM must include a determination of which EHRs to retain and for how long, the assignment of authorities and responsibilities, the design and administration of the process, the integrity of the data, the audit and review of the performance of those processes, how that data are protected and secured (data at rest, data in transit), and management of health information exchange.

Document and Record Management

Record Order		
Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Written policy identifies the reports that make up each record type (e.g., inpatient, emergency room) and the specific document order in the chart. HIM staff members ensure the chart is in the order specified in the supporting procedure before filing.	Written policies specify which reports and documents make up the legal health record as defined by the organization. The policies identify which reports are paper and which are electronic. As the need to print and assemble paper-based records diminishes, HIM management must transfer or retrain staff to work in other operational areas (e.g., assembly clerks might be trained to perform document preparation or scanning if imaging has been deployed). When the EHR is printed, a standardized chart order must be developed based on the user's needs (e.g., different EHR views may necessitate different assembly order for lawyers and patients).	Record order may continue to be important to HIM once a totally electronic format is achieved. If scanning documents continues to be part of the EHR, the processing of the documents before scanning, indexing, display, storing, and destruction will be an essential function. Format and access should be defined according to the information system chosen and the user's need for protected health information (PHI) relative to his or her job for both display and print capabilities. When the EHR must be printed, a standardized chart order based on the user's needs must be developed (e.g., different EHR views may necessitate different assembly order for lawyers and patients). Develop print groups of the record that are printed out when a paper medical record is needed.

Workflow Changes		
Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Written policies list the reports required to signify the record is complete and ready for purposes such as coding, release of information (ROI), and meeting the organization's legal definition. Staff members follow written procedures to review each record received in the department. Forms inventory is critical, as is forms design, for efficient capture of information.	Consider electronic rules and alerts on ROI requirements to allow for expanded delegation of ROI operational capabilities and responsibilities. Develop policies for disclosure tracking and auditing capabilities. Determine whether ROI will remain centralized in HIM or be decentralized. Ensure that the organization has carefully planned EHR content and access before moving coding or transcription functions off-site (e.g., will coding professionals require online access to clinical documentation, such as doctors' progress notes?). Forms inventory and design become even more critical at this phase because efficient processing (scanning, indexing, and online review) is predicated on effective forms management. Define when the record is complete for coding purposes (e.g., which reports will be available to coding professionals and in which format-paper or electronic).	Consider work queues that are built into electronic record systems that will drive staff members' work for the day (e.g., verbal orders that are not signed, transcriptions, etc.). Consider electronic rules and alerts on ROI requirements to allow for expanded delegation of ROI operational capabilities and responsibilities. Develop policies for disclosure tracking and auditing capabilities. Determine whether the ROI will remain centralized in HIM or be decentralized. Ensure the organization possesses appropriate access to EHR content before moving coding or transcription functions off-site. Define when the record is complete for coding purposes (e.g., must specific

	Conduct a workflow analysis determining current manual and paper processes that will be electronic. Look for duplication, redundancies, and inefficiencies associated with the current manual process. Streamline current processes preparing for the transition (reduce duplication of efforts, redundancy of entering data, and other related inefficiencies).	reports be available to coding professionals before coding?). Forms management and control are essential so that manual processing is avoided and the EHR can be upheld legally without disruption of unofficial forms.

Record Completion		
Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Written procedures outline deficiencies to look for when reviewing the different record types (e.g., inpatient, emergency room). Each record is reviewed for presence or absence of reports requiring necessary signatures. With use of an automated deficiency system, deficiencies are entered manually into the system for tracking and notification that completion is necessary.	Written procedures outline deficiencies to look for when reviewing the different record types (e.g., inpatient, emergency room). Review and consider e-signature processing capabilities, limitations, and opportunities for electronic portions of the EHR.* Determine if the vendor can automate deficiency analysis. Establish business rules for viewing the EHR on the basis of an individual's role and the completion status of a document (e.g., should ROI staff see only complete electronic records?). Ensure EHR system capabilities to monitor and track record or document completion (e.g., notifications to individual clinicians, aggregated management screens, and reports for HIM).	Consider electronic rules and alerts to clinicians for the completion of the record. Procedures in HIM outline auditing this completion process versus analyzing the record for completion. Written procedures outline deficiencies to look for when reviewing the different record types (e.g., inpatient, emergency room). Review and consider e-signature processing capabilities, limitations, and opportunities for electronic portions of the EHR.* Determine if the vendor can automate deficiency analysis. Establish business rules for viewing the EHR on the basis of an individual's role and the completion status of a document (e.g., should ROI staff see only complete electronic records?). Ensure EHR system capabilities to monitor and track record or document completion (e.g., notifications to individual clinicians, aggregated management screens, and reports for HIM).
*Consolidated Health Informatics. "Standards Adoption Recommendation." Available online at http://www.ncvhs.hhs.gov/061011p2b.pdf		

Filing		
Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Records are filed in folders, and each is as- signed a patient-specific number. Organizational policy should define the medical record numbering system used. Policy defines where and how records are stored. Retention schedule is included in the policy.	Determine which file room operations are needed to ensure acceptable productivity and customer service levels in a hybrid file room environment (e.g., a combination of hard-copy records, scanned records, and information in a data repository). Considerations should include: • Functions and tasks • Hours of operation • After-hours access and backup	Review file room staffing and need to reduce or redefine staff as the record becomes fully electronic. Determine whether any of the paper record will be converted to electronic format or whether paper records will be phased out over time as a result of retention and purging policies.

Policy outlines handling and storage of incomplete records, as well as when the record is considered complete for permanent filing.	• Staffing needs • Record control • Filing and indexing • Retention, purging, archiving	Establish policies and procedures to outline the management of remaining paper records to include loose sheets and any outside records.

Locking the Record		
Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Written policies and procedures define when the record is complete and permanently filed (e.g., all loose reports filed, deficiencies complete, coding done).	Written policies and procedures define which part of the record is kept as paper and which is electronic. Policy also defines when both paper and electronic portions of a hybrid record are considered complete (e.g., no additional processing is required, all reports are complete). Complete records are locked and avail- able as read only. Any subsequent additions, changes, or deletions are handled as addenda to the record. Policies and procedures must define which documents are to be signed electronically and which are to be signed manually, as well as how to handle the existence of both electronic and manual signatures on the same or different versions of the document.	Written policies and procedures define when a record is considered complete (e.g., no additional processing is required, all reports are complete). Policy must indicate at what point electronic documents are locked and available as read only. Any subsequent additions, changes, or deletions are handled as addenda to the record. Software must have the ability to insert a record document in such a way that the entire record is retrievable, regardless of the discontinuity of episodes of care or late additions of documentation to a single episode of care.

Report Capabilities		
Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Data are abstracted from medical records and manually entered into abstracting software. Depending on the capabilities of the abstracting software or other information system, reports may be available from these data electronically. If no electronic reporting capability exists, reports may be prepared by using data from printed reports produced by the system.	Report-writing software may be available that will pull data from the abstracting and other systems. There also may be predefined (e.g., standard or boilerplate) reports available that are part of the electronic portion of the medical record.	Software should have the greatest possible functionality, flexibility, and integration capabilities to enable data to be pulled from any part of the electronic record (e.g., abstracting, billing, ADT). Data from all applications should be available and able to be formatted as needed for presentation or analysis. Flexibility in report functionality (such as graphing) is a major asset. Predefined (or standard) reports can be developed for routine reporting.

Version Control
Version control is required to manage different iterations of documents (such as when a document has been displayed in an unsigned state in a medical record). Once the person authenticating the document signs it, a new version of the document is displayed. However, if the signer makes changes to the content of the document in addition to signing it, a decision must be made as to whether both versions of the document need to be available.

HIM departments long have had to determine whether to retain older versions of documents in the complete medical record. (The laboratory, for example, often has multiple versions of test results from the initial preliminary result until the final result is available.)

In hybrid and fully electronic health records, it is important to have a flag or other signal indicating that previous versions of the document exist. System documentation should include a clear indication of when each version was viewable by caregivers for use in making clinical decisions. Another version control scenario to consider carefully is when amendments are made to documents through the organizationally approved process.

Every organization should determine the capacity of their medical records in each state of being (paper, hybrid, or fully electronic) to allow appropriate viewing of earlier versions of documents and develop policy that reflects the capability of the individual EHR. At the very least, caregivers should be made aware that earlier versions of documents exist, and they must be able to access them if needed.

Policy and procedure also are needed detailing how disclosures of documents with multiple versions are to be handled. This is not a new issue with EHRM and should be considered carefully and redefined during the migration from paper through a hybrid state and into a fully electronic record. Are all versions released or only the final version? Each organization must specify what will be released when copies of the record are requested. It may be acceptable to release only the final versions of documents if there have been no changes between versions except the addition of signatures or minor editorial changes. However, if clinical information that may have been critical to caregiver decision making has changed, it may be appropriate to release previous versions of documents in addition to the final version.

Another consideration is the HIPAA requirement to notify all parties who may have been sent copies of health records to be notified when there is a change. A procedure for accomplishing this notification must be integrated into organizational policies and procedures to ensure compliance.

Reconciliation for Electronic Processes

Reconciliation is the process of checking individual data elements, reports, or files against each other to resolve discrepancies in accuracy of data. Reconciliation ensures that data are complete, accurate, and consistent. Just as HIM departments perform reconciliation processes for the paper record, the need for quality oversight to reconcile data continues and often expands with the EHR.

The focus on timely reconciliation processes has accelerated with the advent of the EHR. Processing must move from five days a week to seven days a week throughout the year. As the reliance on the EHR increases, processes such as ensuring that data move across interfaces for timely posting in the record and elimination of duplicate medical record numbers become critical for effective care decisions.

HIM professionals are skilled at creating and managing processes that ensure attention to detail and have a broad understanding of the flow of information across the care continuum. Orientation to detail and a broad understanding of the effect of timely, quality information are necessary traits for successful implementation and maintenance of the EHR. HIM professionals also understand how to balance and prioritize the criticality of clinical information and business system needs.

	Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Inpatient Visits	Verify that a record exists for each discharge. Verify correct patient type registered (e.g., inpatient, short stay, observation status) to ensure accurate billing.	Same with the addition of monitoring canceled admissions.	Same
Emergency Department,	Verify that record exists for every registration.	Same with the addition of monitoring canceled admissions.	Same

Outpatient, Observation, and Clinic Visits	Verify correct registration of multiple visits in one day according to APC regulations.		
Interface Engine	N/A	Monitor interface engine logs at least daily for failed reports. Research and correct documents that fail to cross an interface between disparate computer systems (e.g., stand-alone transcription system to an EHR). Ensure that documents are posted to the correct encounter and are in the correct location. Verify that content remains constant when moved from one system or database to another. The extent of reconciliation increases with the number of disparate computer systems.	Same
Master Patient Index and Enterprise Master Patient Index (EMPI)	Correct duplicate patient name and number entries by accurately matching patients to paper records. Ensure match to all computer systems (e.g., laboratory, radiology, pharmacy, and billing). Correct other or duplicate names in system (e.g., legal guardian names) through verification of secondary matched data elements. Process must be in place for quality checks and identification of duplicates or potential duplicates.	Same issues as in the paper-based record.	Same issues as paper-based and hybrid records. The EHR may be able to identify automatically the components of records in other electronic systems and provide notification of changes.
In-box Maintenance	N/A	Monitor unopened mail and incomplete documentation (e.g., unsigned dictations, and unreviewed results,	Same
Autofaxing Files and Automatic Data Transfers	Monitor transcription systems for failures of sent documents. Periodically validate that fax numbers work and that	Expanded monitoring including voice recognition and direct charting.	Expanded to include transfer of EHR files for ROI, autofaxing to community physicians, download of EHR data to patient personal health records, and community-

	remote fax machines are located in secure locations.		based health records or databases.
Work Queues	Primarily focused on HIM department systems such as coding and incomplete chart tracking.	Expanded to include scanning system.	Extended to entire EHR.
Downtime Processes	None except for HIM functions.	Ensure online data are captured after downtime through direct entry or scanning.	In addition to more detailed and lengthy postdowntime data capture, ensure that data flow to a data warehouse or other repository in a timely manner and in the correct sequence. Track legal EHR variations from the policy on individual records for all downtimes, as well as historically for lengthy downtimes.
Patient/Legal Guardian Amendments Living Wills and Durable Powers of Attorney for Healthcare Decision Making	Ensure documentation is filed in paper record.	Ensure documentation is scanned into EHR or post a flag that indicates such documents exist and how to access them.	Ensure documentation is either scanned into the EHR or ensure the amendment made online adheres to the agreed on amendment process.

Managing Other Types of Digital Records and Data

HIM expanded into EHRM in conjunction with the advancement of digital technologies. No longer are health records made up of analog (i.e., paper-based) discharge summaries, progress notes, physicians' orders, and flow sheets. Digital electronic reports from the laboratory and pharmacy, digital nurses' notes, e-mail and voice messages containing PHI, digital X-rays, digital photographs from the emergency department, digital material received from other facilities, video files of cardiac catheterizations, and audio recordings of heartbeats are all part of the clinical data gathered about patients. There is also a wealth of patient-generated health data to be considered, including data collected by personal wearable devices and various smartphone apps that collect and store health data. Consequently, all electronic information that is generated about patients in healthcare organizations-regardless of the record type and storage medium-may be classified as part of the EHR. Therefore, all the different, electronic types of records, such as e-mail and voice-mail records, and all the different data types, such as discrete, structured data and unstructured free text, diagnostic image, document image, vector graphic, audio, and video data that are part of the EHR must be well understood and well managed.

Other Types of Digital Records
E-mail E-mail has become a record-generating and communication system vital to the business processes within healthcare organizations. It has replaced most healthcare organizations' traditional analog communication processes, and it is being used increasingly for a number of nontraditional e-mail activities, such as sending secured, digital reference laboratory results and

attaching secured, digital discharge summaries to the physician's office. Therefore, it is essential to manage e-mail with the same thought and attention that have gone into managing other types of patient records.

E-mail is another type of business record and is subject to the same course of evidentiary discovery as any other healthcare organizational business record, such as the patient medical record, patient financial record, or employee record. In addition, e-mail messages have a life cycle just like any other record. E-mail messages are created, indexed, searched, retrieved, routed, stored, and purged. More importantly, e-mail is now one of healthcare organizations' largest and most vital information assets. Therefore, like any other business records, e-mail records and the information contained in the e-mail require EHRM.

The first step in e-mail management should be to retain e-mails within an overall electronic document management strategy. For example, most often, the information contained in e-mails is interconnected (e.g., regarding Mary Smith's diagnosis, the privacy official's recent meeting minutes, etc.). To ensure that all the e-mails relating to Mary Smith or the organization's privacy meetings can be located, it makes sense that the strategy includes identifying the existing enterprise-wide repositories that securely store e-mail records and attachments that merit evidentiary handling.

Next, to reduce the legal risks of e-mail records, healthcare organizations should develop or acquire an e-mail management system. This system should include a centralized archive. In addition, the system must be easy to use, providing intuitive methods for identifying e-mail classification (such as patients) and retention rules. The system also must provide fast and efficient access to the archive, including tried-and-true search capabilities. Finally, the system must work with today's popular e-mail systems, such as Microsoft Exchange, and be seamlessly integrated into the EHR.

For example, the system should enforce e-mail archiving policies. When an individual closes an e-mail and is ready to discard or save it, a prompt should appears with a yes or no choice asking if the user would like to make this a part of any of the healthcare organization's business records, such as the classification of patient medical records. If the healthcare organization declares ahead of time that the e-mail must always be retained to comply with a regulatory, legal, or business need, such as an e-mail correspondence between a provider and a patient, then this opt-in or opt-out e-mail capture function can be eliminated. In addition, this function can be managed in the background by using Web technology so that, for example, each new patient added to the master patient index triggers a domain name with all inbound and outbound mail captured for "patientname.com."

Retention rules should be triggered automatically by actions, which include automatically deleting or encrypting a "patient class" of e-mail after a defined number of days, months, or years so it cannot be accessed. (Note: Never archive encrypted e-mail records for fear of losing the algorithms or keys.) This process can include issuing an e-mail notification to all authorized users when, for example, e-mail records one through 100 for "patientname.com" are approaching the organization's retention mark or issuing an e-mail notification when user mailboxes contain more than, for example, 100 MB of messages.

Despite good intentions, such systems quickly become overwhelmed by metadata and attachments. In terms of a storage crisis, attachments present a significant risk. Perhaps a problem of greater importance is the proliferation of e-mail copies (i.e., carbon copies and blind copies). Copies produce a negative effect on healthcare organizations' abilities to discard all e-mail record copies at the end of retention periods. Therefore, creating the appropriate rules, policies, and processes must precede system deployment.

Like other business records, e-mail records present a huge opportunity to reduce the risks of enormous legal costs in evidentiary proceedings. On the other hand, their anticipated explosive growth and growing significance in the legal process present formidable challenges. The opportunity for HIM professionals to manage the organization's patient e-mail records just like other records will allow HIM professionals to oversee the aspects of many enterprise-wide information repositories and focus on both the digital and analog patient record repositories inside and outside their existing domains.

Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
E-mail messages, such as those containing PHI, could be printed to paper and filed in the appropriate folder.	E-mail messages, such as those containing PHI, are printed to paper and filed in appropriate folders.	E-mail messages, such as those containing PHI, are integrated seamlessly into the EHR, where they are indexed and can be searched, retrieved, routed, stored, and purged or destroyed.

		E-mail messages containing PHI are encrypted in transit and at rest.

Voice Mail and Phone Messages

Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
Analog voice-mail messages, such as those containing PHI, may be transcribed into a paper-based written note for the medical record. Analog telephone messages or notes may be documented as progress notes or orders that are later appropriately verified by the physician.	Analog or digital voice-mail messages, such as those containing PHI, may be transcribed into a paper-based written note and filed in appropriate folders.	Digital voice-mail messages containing PHI and telephone conversations with patients or providers (e.g., changes in condition, medication, treatment) should be documented or imported into the EHR where they are indexed and can be searched, retrieved, routed, stored, and purged or destroyed. Complete documentation of patient and provider identification, date, and time of the actual conversation or message, as well as the date and time of the entry into the EHR.

Material Received from Other Facilities (e.g., hard copy, diagnostic images, cine films, compact discs)

Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
Hard-copy material is incorporated into the paper-based medical record according to written organizational policy. Diagnostic images, cine film, and CDs are reviewed by healthcare providers and may be returned to the originators after copies are made if they are deemed necessary. If copies are made, they should be filed in an easily identifiable and accessible storage repository, such as in an analog film library or in CD jackets that can be attached to the paper chart.	Hard-copy material may be scanned into the document image-enabled EHR according to written policies and procedures. Depending on the status of the EHR, digital diagnostic images and cine film, including those stored on CDs, may become part of the EHR. Analog diagnostic images, cine film, and CDs may be stored in the appropriate storage repository of the appropriate facility department.	Hard-copy materials are scanned into the document image-enabled EHR following written policies and procedures. Digital diagnostic images and cine film, including those stored on CDs, become part of the EHR.

Other Types of Data

Free Text

Free text is one type of unstructured data found in EHRs. Free-text data are narrative. The data are generated by word- or text-processing systems, and their fields are not predefined, limited, discrete, or structured. Instead, their fields are unlimited and unstructured. When a healthcare professional needs to search unstructured free text, it is not a simple task for the information system's search engine to find, retrieve, and allow the user to manipulate one or more of the data fields or elements embedded in the text. Typically, EHR free text is found in healthcare information systems' comments fields and in the documents generated by healthcare transcription systems.

Many EHR users like to generate free text by typing unstructured, narrative information into EHR comment or related fields and documents instead of pointing and clicking structured data into EHRs because they are used to typing information into e-mail messages and other electronic documents to express their findings and recommendations (similar to the way they handwrite findings and recommendations into analog [e.g., paper] documents). When users are required to point and click pieces of information or phrases into electronic fields and documents in EHR systems, they often complain that the point-and-click data input method takes more time than typing, that the composed sentences based on pointing and clicking appear rudimentary, or that the structured data elements for pointing and clicking cannot be located easily on the screens.

Some EHR users like to generate unstructured free text by dictating narrative information into digital-dictation or speech-recognition systems. Once the information is transcribed by word-processing systems or translated to text by speech-recognition systems, familiar easy-to-read and easy-to-understand documents are presented to the user. Such documents include but are not limited to radiology and pathology result reports, operative reports, and clinical notes and evaluations. (Note: Speech-recognition system engines take the unstructured, free text–based voice data and codify the data, often with the help of templates. Hence, the format of the output text data from these systems becomes structured, with predefined and limited fields.)

Free text is important in the management of EHRs.

1. Because free text is unstructured and not easy for electronic search, retrieval, and manipulation functions, many information systems of structured data (e.g., healthcare information systems, clinical information systems) do not allow for free-text data entry or carefully limit such options on their screens.
2. To speed up the documentation process and avoid duplication of effort, many EHR users copy and paste free-text data into their SOAP notes, progress notes, and narrative reports. Just as with paper-based records, EHR users must be held responsible for their record entries that are not complete, accurate, timely, and authenticated. Therefore, healthcare organizations should develop policies and procedures related to copying and pasting free-text documentation into EHR systems.

   The copying and pasting action poses several risks, including but not limited to:

   - Copying and pasting the note to the wrong encounter or the wrong patient
   - Copying and pasting abnormal laboratory or X-ray results into notes without addressing the abnormalities in the note, which could be used as evidence of carelessness or negligence
   - Lacking the identification of the original author and date

   In addition, the action of copying and pasting free-text data into the EHR can lead to documentation excesses. Such excesses can be unnecessary duplication of information that not only lengthen the notes and reports but make the notes and reports more difficult for other caregivers to read. In addition, such excesses take up space in computer memory that is potentially limited and slow computer retrieval times.

3. Digital dictation, transcription (word-processing), and speech-recognition systems must be integrated carefully into EHR systems, the systems responsible for meeting all legal (local, state, federal) requirements in the areas of document authentication and retention. Therefore, standards, such as those recommended by Health Level Seven (HL7), version 2.3 and higher, must be deployed for document message transfer between these systems and the EHR. Key features include the electronic capture and integration of text reports into the EHR and the electronic scanning and correcting of each report for omissions and inaccuracies of patient and provider identification data. In addition, key EHRM tasks must include collecting appropriate signatures; allowing for the review and retrieval of the text reports; and archiving the text reports in a way that allows for economical, long-term storage and eventual destruction.

Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Handwritten findings and recommendations in analog, paper-based documents and forms.	Some handwritten findings and recommendations in analog, paper-based documents and forms. Some typing into electronic systems' comments fields. Some dictating into digital dictation systems for subsequent transcription.	Pointing and clicking findings and recommendations into electronic information systems. Dictating into speech-recognition systems with natural language processing capabilities.

Digital Images, Photos, Video, Audio, and Graphic Files

In the development of a recommendation, the fundamental requirements considered for representing multimedia objects in patient EHRs include that the objects stored in the patient records are uniquely identifiable persistent entities and that the objects contain patient study, study component, examination, equipment, unique identification, and other information (e.g., date, creator, body part) as attributes and metadata in addition to the objects themselves. The following items are recommended for future consideration and research support to address issues related to multimedia patient information:

1. Standards committee collaborations-As the standards continue to develop, it is recommended that the Digital Imaging and Communications in Medicine (DICOM) and HL7 standards developing organizations (and others as appropriate) work together to harmonize their standards for healthcare applications.
2. Time to incorporate industry standards-Consideration should be given to providing support for reducing the time between implementation of industry standards and incorporation into federal standards.
3. Long-term storage and retrieval of information-Consideration should be given to accounting for problems associated with the migration of information among media bases-problems that are partly due to rapidly changing information technologies.
4. Unique identifiers-Assignment of unique identifiers should be supported in the Integrating the Healthcare Enterprise initiative to provide harmony with DICOM, HL7, and other standards.
5. Computer system firewalls-For biomedical information exchange between agencies, issues of computer system security and firewalls are often a larger hindrance to effortless communication than are the use of different data standards within agencies. Additional research is needed to develop secure data systems that remain open to exchange of large data sets from the outside.

Access Control and Nonrepudiation

With the implementation of an EHR comes the opportunity to improve access to patient health information. Used by the right people under the right circumstances, this improved access will lead to better communication among care providers; more information about the patient's history, current conditions, and treatments; and more organized delivery of healthcare. However, if the information becomes accessible to the wrong people or under the wrong circumstances, patient confidentiality will be breached and patient trust in the healthcare system will erode.

Precautions must be taken to reduce the risk of breaches of confidentiality of patient information.

Access Control

Access control is the process that determines who is authorized to access patient information in the health record. In paper-based records, access is controlled through physical security safeguards, chart tracking, and outguide systems.

HIPAA privacy and security standards support the idea of providing access by determining the needs of groups of users. Facilities must identify such groups and then determine to what information the group needs access and under what circumstances, which includes determining the subsets of the information an individual is authorized to access and the functions the individual will be able to perform using the information.

For example, one group could be identified as "physician of record." This group would include any physician who had been listed as the primary, admitting, attending, dictating, consulting, or ordering physician in the EHR system. This group would be allowed to view all information included in the record of the patient, but they might not be allowed to fax or print the information. On the other hand, an ROI group would be allowed access to all patient information for viewing, printing, and faxing.

Authorization for access to information also can be granted on the basis of other criteria besides membership in a group. Items such as terminal address, day of week, or time of day can be considered. For example, if a department operates from 8 a.m. to 5 p.m., the system could be set up so that no terminals in the department would be able to access patient information outside those hours.

Access should be terminated automatically after a certain period of inactivity. Groups also can set the length of system inactivity. The access for nurses on a nursing unit could time out after 10 minutes of inactivity; access for coding professionals should be set for a longer time, since coding professionals often must review numerous documents before determining a code.

Sophisticated EHR systems can limit access according to document type or field in the patient record.

Access to information for emergency situations should be considered during the process of defining access, sometimes referred to as "break-the-glass" access. Clinicians requiring access to PHI during an emergency should be allowed easy access to it. However, every incidence of such access should be monitored carefully by using audit trails within a reasonable time after the access.

When authorization is granted, the individual must be made known to the system. The term for this is "authentication" and can be accomplished by using a "what you know, who you are, or what you have" model.

Giving the individual a user name and password generally addresses "what you know." The user name is kept in a file that identifies the information that the individual can access and the functions that the individual can perform. This model is termed "single-factor identification," since it requires only that the user know both the password and user name.

"Who you are" refers to some form of biometric identification including fingerprints, retinal scans, and voice recognition. These more sophisticated forms of authentication require additional devices be connected to each access device (e.g., PC, laptop, PDA) to record the imprint.

"What you have" relates to a smart card or other item the user carries that can be used to identify the user.

At least two of the above factors should be joined to produce strong authentication to clinical systems. Users generally are accustomed to a two-factor model, since most bank cards require the purchaser to have a card and use a personal identification number or password to complete a transaction.

Organizations will have to find ways to accommodate providers by using multiple systems that require the use of unique passwords for each system. The concept of single sign-on, which allows a provider to be authenticated to use the EHR one time, rather than having to log in to every application he or she is authorized to access, is very much a topic of discussion but is not a reality in most organizations today.

Nonrepudiation

Many of the users authorized to access patient information also will be authorized to enter information, such as e-mail, notations, and transcribed reports. An individual authorized to provide this type of documentation to a patient record also should be authorized to use some type of electronic signature or other method of attestation. Rules connected to the application of the electronic signature can cause the notation or document to be "locked," which reduces the likelihood that an individual, including the original author, will be able at a later date to make changes to the information originally recorded. In addition, date and time stamps should be associated with the signature so one can prove when a document was finalized. The use of nonrepudiation reduces the likelihood that an author can deny having made the entry or the timing of that entry.

Amendments, Corrections, and Deletions

A key component of records management is the handling of addendums, amendments, corrections, and deletions. These are not new concepts or requirements within HIM. When a healthcare provider determines that patient care documentation is inaccurate or incomplete, he or she must follow established policy to ensure the integrity of the record.

From an EHR standpoint, there are guidelines that provide the required direction for creating and managing electronic documents in the health record. Refer to American Society for Testing and Materials and HL7 guidelines for the technical requirements that should be followed. Organizations must establish policy on addendums, amendments, corrections, and deletions within their medical record documentation policies so that the integrity of the record remains intact and in compliance

with documentation standards. Policy should delineate the time frames within which the corrections and deletions will be made, and also, in conjunction with HIPAA compliance policy, outline what is necessary to make changes to the record.

The policy and procedure includes information about where the additional information is located within the body of the original report and the requirement that the addendum, amendment, or correction include a separate signature, date, and timed entry. The procedure indicates who is responsible for entering addendums, amendments, and corrections into the EHR.

These changes should be made in the source system where the documentation was originally created, as well as in any long-term medical record or data repository system. Under legal advisement, the organization should have processes in place for forwarding the changes to any other place where the information has been sent to ensure that providers have the most up-to-date information.

The policy should require that the total elimination of information should never occur. If the organization allows information to be deleted, it requires clear policies and procedures to ensure the integrity of the health record, and it should monitor and audit this functionality. Organizations that allow this functionality should review carefully clinical actions taken on the basis of initial documentation.

The electronic processes by which the corrections, deletions, and amendments are made probably will vary from developer to developer. Not all will handle the issue in the same way, even given the American Society for Testing and Materials and HL7 guidelines. There are some process characteristics, however, that should be present in all systems for correcting and deleting data.

For an individual datum or free-text response, the correction and deletion process should be made in the originating system, as well as in the long-term, archived medical record system or data repository. Documentation should be maintained of the correction or deletion, identifying date of correction, data dictionary code of the datum corrected, incorrect value of the datum, and user code of the individual certifying the datum to be incorrect.

For text reports, there should be an option to mark the report “corrected final” in addition to “preliminary” or “final.” It may be possible to attach only an addendum to the report. Again, the document ID of the original document should be maintained with reference to the document ID of the corrected document along with date of correction and user code of the individual certifying the datum to be incorrect.

	Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Corrections/ Amendments	Draw a line through the original entry in such a way that the original entry remains legible. Do not alter the original record in any way. Print the word “error” at the top of the entry, sign with name, discipline, date, and time. Indicate the reason for the correction (e.g., incorrect patient). Note the change or addition in proper chronological order.	Use both the paper and electronic processes, depending on how your documentation is created.	Corrections must be made in the source system (where the document was originally created), as well as in the long-term medical record or data repository system. The type of correction should be noted (error, delete, etc.) at the top of the entry, signed with name, discipline, date, and time. Maintain the original incorrect entry or document and add the corrected entry or companion document to it.
Addendas	New documentation used to add information to an original entry.	Use both the paper and electronic processes, depending on how the documentation is created.	Corrections must be made in the source system (where the document was originally created), as well as in

	Addenda should be timely and bear the current date and reason for the additional information being added to the health record.		the long-term medical record or data repository system. The type of correction should be noted (addendum) at the top of the entry, signed with name, discipline, date, and time.
Deletions/ Retractions	Nothing is removed from a paper record. Follow the steps as noted above.	Use both the paper and electronic processes, depending on how the documentation is created.	The computer should be able to hide an original datum or document from view and replace it with a corrected datum or document. However, the original information must be retained and made available if necessary.

Purge and Destruction

Every healthcare facility must have an approved retention schedule that must apply to all paper records and EHRs. It also must include the retention schedule of the metadata (description of data and its underlying applications and programs) and audit trails. A file management system must be capable of notifying the user with a retention trigger (such as 10 years from filing date, at completion of the case, or expiration plus three years).

Selective Destruction

In an entirely EHR world, it becomes possible to use a process of selective destruction in which some types of documentation can be retained while other documentation can be destroyed. If selective destruction is the organizational choice, the policy for record retention and destruction of EHRs should outline the protocol for selective destruction on the basis of the types of documentation found in the record. Once the statute of limitations has expired on an episode of care, it then is possible for documentation to be destroyed. In the electronic record, every type of documentation can be evaluated individually for retention, with the recognition that not all documents have the same need for retention. For example, once the statute of limitations has expired, is it really necessary to keep all the nursing graphic documentation? Perhaps the progress notes of attending physicians would be retained, but notes of medical students and first-year interns would not. A facility could decide to retain the discharge summary, operative report(s), pathology report(s), and diagnostic data but nothing else. Once decisions are made according to the protocol, electronic files can be destroyed according to facility data security policy.

Destruction of Paper and EHR Media

As governed by state and federal guidelines, PHI stored in paper, electronic, or other formats must be destroyed at the end of its retention period by using an acceptable method of destruction. Acceptable measures of destruction include shredding, incineration, and pulverization.

A destruction log must be maintained to identify the destroyed records. At minimum, the destruction log must capture the information listed below:

a. Date of destruction
b. Name(s) of the individuals responsible for destroying the records
c. Witness (name(s) of the person witnessing the destruction)
d. Method of destruction
e. Patient information including full name, medical record number, date of admission, date of discharge

If the records are destroyed by a third-party destruction company, a certificate of destruction should be obtained attesting to destruction of the records. The destruction log must be maintained permanently.

Disposal/Destruction Protocols for Electronic Patient Health Information

Computer Data and Media

Workstations, laptops, and servers use hard drives to store a wide variety of information. Patient health information may be stored on a number of areas on a computer hard drive. Simply deleting these files or folders containing this information does not necessarily erase the data.

1. To ensure that any patient's health information has been removed, utility software that overwrites the entire disk drive must be used, which could be accomplished by overwriting the data with a series of characters. Total data destruction does not occur until the backup tapes have been overwritten. Magnetic neutralization will leave the domain in random patterns with no preference to orientation, rendering previous data unrecoverable.
2. If the computer is being redeployed internally or disposed of owing to obsolescence, the aforementioned utility must be run against the computer's hard drive, after which the hard drive may be reformatted and a standard software image loaded on the reformatted drive.
3. If the computer is being disposed of owing to damage and it is not possible to run the utility to overwrite the data, then the hard drive must be removed from the computer and physically destroyed. Alternatively, the drive can be erased by use of a magnetic bulk eraser. This requirement applies to PC workstations, laptops, and servers.

Federal guidelines for data disposal and sanitization can be found in the National Institute of Standards and Technology's Special Publication 800–88, *Guidelines for Media Sanitization,* at http://csrc.nist.gov/publications/nistpubs/800-88/NISTSP800-88_rev1.pdf.

CDs and Diskettes

CDs containing patient health information must be shredded or pulverized before disposal. If a service is used for disposal, the vendor should provide a certificate indicating the following:

1. Computers and media that were decommissioned have been disposed of in accordance with environmental regulations, since computers and media may contain hazardous materials.
2. Data stored on the decommissioned computer or media were destroyed according to the previously stated method(s) before disposal.

Methods of destruction and disposal should be reassessed periodically on the basis of current technology, accepted practices, and the availability of timely and cost-effective destruction and disposal services.

User Interfaces and Web Portals

Patient and Provider Entry to the EHR

Web portals began in the consumer market with the large, public online Internet service provider websites, such as AOL. Portals offered end users fast, centralized access to Internet services and information found on the portal sites. In an effort to ensure that visitors would return to sites, the large public directory and search engine sites such as Yahoo began to offer customized and personalized interaction with the Web. Customized interaction allows visitors to create customized, relevant views of the site at the role and individual levels. Personalized interaction provides website sponsors a means to filter information to meet the unique needs of users on the basis of their roles and preferences.

At about the same time, private organizations such as healthcare organizations began to deploy intranets to address internal business needs within secure environments. The intranets became analogous to internal, private "Internets" by restricting access to authorized users. Soon, portals were recognized as a way to provide easy access to private organizations' internal information, offering a central aggregation point or gateway to the data via a Web browser. And the portals became analogous to internal, private "Webs" by restricting access to authorized users. Portals quickly evolved into an effective medium for providing secure access to an organization's applications and systems used by diverse, disconnected participants in various locations.

Like the predecessor clinical workstations in healthcare organizations, clinical and clinician portals began as a way for clinicians to access easily via a Web browser an organization's multiple sources of structured and unstructured data from any network-addressable device and develop loyalty to the healthcare organization. They quickly evolved into an effective medium for providing access to multiple applications, both internal and external.

Therefore, clinical and clinician portals became "private Webs," restricting user access to the data and applications contained within the portal. This capability was crucial to protect the integrity of decisions made by healthcare providers and to ensure confidentiality of patient information.

More important, the portals began to provide more functionality. For example, they included customization capabilities and simplified automated methods of creating taxonomies or categories of data. Similar to how consumer portals such as Yahoo organize files and data into such categories as food, fashion, and travel, clinical and clinician portals might classify files and data according to test results, dictations, and patients.

In addition, portals grew to offer other enabling technologies, such as single sign-on, personalization, document and Web content management, proactive delivery of data, and metadata management. Therefore, in healthcare organizations with EHR implementations, the portals allowed physicians to access the EHR easily.

Quickly, it became clear that clinical and clinician portals could provide a way of addressing some of the cost issues of implementing EHR capabilities across the enterprise, including which EHR information and transactions could benefit patients. Consequently, savvy chief information officers and marketing executives determined that extending the reach of the portal to the patient could enhance the healthcare organization's image and relationship with its customers, as well as develop community loyalty.

Soon portals developed into an efficient way to organize all the information (structured, such as relational data, and unstructured, such as e-mail, Web pages, and text documents) that clinicians and patients needed to access routinely. Consequently, today, clinician and patient Web portals are viewed as the single point of personalized access (i.e., an entryway) through which to find, organize, and deliver *all* the content contained in the EHR.

Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Not applicable	Some integration of an organization's multiple sources of structured and unstructured data, as well as back-end applications, allow clinicians with proper authorization to access pieces of the EHR easily. No access by patients.	Complete integration of an organization's multiple sources of structured and unstructured content, allowing clinicians and patients with proper authorization to access the EHR easily.

Managing Patient Identification

Managing patient, resident, and client identification can be a major challenge for facilities in the EHR environment. The issues are not new, and HIM professionals are more aware of the issues because electronic systems can make the incongruities more visible. With today's emphasis on patient safety, accurate and consistent patient identification becomes all the more important. No facility wants its medical and nursing staff placed in the position of administering an appropriately grouped and cross-matched blood transfusion to an improperly identified patient.

A master patient index may index patients, persons, healthcare plan members, guarantors, subscribers, physicians, healthcare practitioners, payers, employees, employers, and others. If it is shared by two or more care centers it may be called an enterprise master patient index (EMPI), enterprise patient index, corporate person index, or multifacility index.

The most common incongruities found in EMPI management are duplicates and overlays. Duplicates are identified as one patient having two or more medical record numbers or other identifiers in the same facility or division of an enterprise (across some large enterprises, however, patients purposely have a different medical record number in multiple facilities tied together by an enterprise-wide corporate identifier). Overlays are identified as two different patients' records being indexed to one medical record number.

In some facilities, because of the nature of the services provided, patients are indexed purposely to an alias and a medical record number or other identifier in the EMPI to facilitate care. Thus, in some Level I trauma centers, trauma services alias and medical record numbers (e.g., ZEBRA, TR080 #01582444) are assigned to facilitate prehospital care when the patient cannot be identified accurately in the field. Similarly, facilities offering psychiatric emergency services or routine psychiatric services purposely may duplicate an alias and medical record number for a patient so care can commence when patients may not be able to identify themselves accurately because of their psychiatric conditions (e.g., MARIGOLD, PES041 #01582678). Later, when the patient's condition has stabilized, the patient can be identified accurately after research in the EMPI or other resources and the alias name and medical record number merged to the correct number by EMPI staff. Use of these aliases and medical record identifiers also obviates the use of John or Jane Doe aliases, which are difficult to manage because of the huge volume of patients that eventually can be attached to them, with thousands and thousands of encounter dates and account numbers.

Management of the EMPI should be an active daily component of the EHRM environment. EMPI staff should be available to admissions and registration staff to help resolve misidentification errors caused by spelling of names and recording of birth dates. As duplicates are identified by clinical staff or other means, EMPI staff should be assigned to investigate the alleged duplicate carefully, matching biometrics, signatures, and diagnoses identified in a first medical record with those of a second. Merging to one of the numbers should be undertaken only after thorough analysis of both the electronic results and text documents available online and the paper-based documents and reports available only in nonelectronic formats. Similar processes should be used to verify existing index entries for patients assigned trauma or psychiatric care aliases and identifiers.

Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Usually housed in index card files, one 3x5" card is assigned per patient name. Merging is noted on the card and in the main file, forwarding the user to a later or earlier number. Physical paper records are moved from one numbered cover to another. Prepare appropriately named, identified, and bar-coded folders as necessary.	Unusual to see with respect to this function. Day to day same functioning as paper-based systems. Electronic records may have to be moved within electronic source and archival systems.	EMPI is a major database component of all vended health information systems. Lookup functionality should include a probabilistic algorithm to help admissions and registration staff choose the correct client. Identified duplicates are merged with the catalogue kept of all medical record numbers, aliases, or other identifiers stopped, including the dates when they were stopped. Account numbers, diagnostic results, and documents must be integrated into the correct chronology of the patient's record of services and attached to the persisting name and medical record number. When results or documents are viewed subsequently, the system should tell the viewer the date and time that the results or document came into the current record. Audit trails should document all details of the merge and the relocation of results and documents, as well as the ID of the staff member performing the merging of the accounts.

Overlays may be an even greater challenge to the management of the EMPI. Often involving direct knowledge of one individual and his or her life by another, two individuals indexed to the same medical record number may be very difficult to resolve. For example, the two individuals may once have been roommates or foster children in the same household and thus know a significant amount of life history about each other. One may possess documents or insurance ID cards from the other, making it easier to assume his or her identity and obtain healthcare services. A mental health patient may invent aliases at presentation for services to prevent nursing staff from learning too much personal information. In these cases, each inpatient admission or presentation for outpatient services must be analyzed for biometrics, signatures, diagnoses, and other minute facts to substantiate the pulling apart of the individual records, if warranted.

Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Since all visits are mixed together on one 3x5" card, after analysis, the resulting two cards will have to be rekeyed to include *only*	Day to day, the same functioning as paper-based systems. Electronic records may	Functionality must be present in the system to allow two records to be pulled apart, encounter by encounter. All text documents, assessments, and diagnostic results associated with an encounter should move automatically with the encounter

those encounter dates and the medical record number belonging to each patient. Preparation of appropriately identified medical record covers for each medical record number and volume must be prepared with appropriate names, identifiers, and bar codes.	have to be moved within electronic source and archival systems to produce two records, with each patient having one medical record number.	rather than having to be moved individually. When results or documents are viewed subsequently, the system should tell the viewer the date and time that the results or document came into the current record. The attachments to the encounters should be audited to ensure the results, assessments, etc., belong to the target patient. Patient account history must be validated so that proper payments are applied to the correct patient or moved to the correct account or encounter, if necessary. Audit trails should document all details of the relocation of results and documents, as well as the ID of the staff member performing the moving of the documents.

Ongoing periodic identification of duplicates should be undertaken by using probabilistic algorithms to identify sets of individuals likely to be the same person. This process should include examination of such factors as name variants, address variants, Social Security numbers, and telephone numbers with weights contributing to the overall probability that the individuals are the same. This report should be produced routinely, such as weekly, biweekly, or monthly, and checked routinely by EMPI staff to clear the EMPI of duplicates. However, just because an individual is identified *possibly* to be the same as another on the duplicate patient report does not mean the record is a duplicate. Each candidate set should be examined in the same method undertaken for possible duplicates identified by other means as discussed above. As the organization moves to a completely electronic system, electronic results, documents, assessments, and demographics must be examined for evidence that the nominated sets are really the same person.

Paper Systems	**Hybrid or Transitional Systems**	**Fully Electronic Systems**
Not applicable because total analysis of index cards for possible duplicates is almost impossible on any periodic basis.	As EMPI moves to an electronic format, sets for examination as possible duplicates should be identified probabilistically. The physical record must be examined carefully to ensure that the identity of the nominated sets is the same.	Probabilistic identification of sets for examination as possible duplicates should be expected. The various electronic results, documents, assessments, and demographics of the nominated set must be examined carefully before merging.

Resources

All AHIMA resources are available online in AHIMA's HIM Body of Knowledge.

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Appendix B: Checklist for Transition to the EHR

Editor's note: This checklist supersedes the 2010 practice brief appendix update that combined and updated the October 2004 practice brief appendix "The Strategic Importance of Electronic Health Records Management: Checklist for Transition to the EHR" and the June 2005 practice brief "A Checklist for Assessing HIM Department Readiness and Planning for the EHR."

This checklist assists in the transition from paper to an electronic health record (EHR) that will serve as a legal medical record for the organization. Whether paper or electronic, an organization's health information system must meet certain standards to be considered a legal business record. This checklist will help organizations and HIM departments prepare for going paperless and ensure that they can get rid of the paper after the EHR implementation.

The decision to go paperless involves having enough confidence in the electronic system to let go of the paper system. This includes ensuring that the system handles amendments, corrections, authentication, backups, downtime, confidentiality, and printouts and reports for disclosure purposes.

Organizational Perspective

- **Executive-Level Committee (ELC):** Form an executive-level committee to review and approve the change to a fully electronic system and obtain executive-level support that will review and approve the migration.
- **Steering Committee:** Form a steering committee that is empowered by the ELC, management, and all members of the organization to establish and implement policies and procedures required to manage the change to a paperless system from start to finish.
- **Legal Health Record Policy:** Review and revise their legal health record policy. The policy should be comprehensive and describe each step involved in the transition, which may mean planning for a hybrid environment (both paper and electronic).
- **Project Plan:** Develop a comprehensive plan of actions and milestones that details each step involved in the move to a fully electronic system. The plan should contain a definitive date for the completion of the migration and should detail individual departmental or divisional rollout dates.
- **Certification:** Ensure the EHR is certified as defined by the Office of the National Coordinator for Health Information Technology.
- **Health Information Exchange (HIE):** Organizations should determine potential partners for HIE efforts, investigate local HIEs or any other statewide HIE. They should:
    - Find out which clinical systems the HIEs currently are using.

- Determine if the organization's EHR will be interoperable with the local HIE efforts.
- Consider the following when setting the date and defining the process for the HIE: Is it for all patients seen after a certain date? For all documents created after a certain date? For all patients discharged or admitted by a certain date? Will all areas of the organization transition at once or individually? Will the organization transition according to unit or document type (e.g., laboratory then radiology then transcription)?
- Develop a comprehensive data map of all organizational workflows and processes that may be affected by the transition to an electronic system. This data map should address both administrative and clinical work flows.
- After an organizational review of these data maps, consider appropriate steps to reengineer and redevelop workflows, as appropriate.
- Develop comprehensive processes and procedures that address the conversion of paper-based documents to an electronic form.

    - Begin to streamline current paper processes by automating forms and documents and store them on a document management portal as a first step.
    - Determine which forms and documents eventually will be eliminated with an EHR.

- Develop a communications plan that provides the organization with a clear understanding of the change process involved in moving toward a fully electronic system. The plan should address the responsibilities of all individuals within the organization (clinical and nonclinical staff). Education and information tasks should be incorporated into the plan. Consider the use of letters, posters, fliers, e-mail, or presentations with a clear message of the change. Review the practice brief "Understanding the HIE Landscape," available in AHIMA's HIM Body of Knowledge.

HIM Operations Perspective

- **Leadership:** Determine who needs to be involved in planning the EHR migration and evaluating its effect on the HIM department. The project team should include members representing all segments of the HIM department.
- **HIM Functionality:** Document the organizational and proposed system processes for amendments, corrections, authentication, backups, and downtime. Will the system provide all the necessary HIM functionality? Will it be phased in or a single installation? Will support be provided locally or remotely?
- **Site Visits:** Visit other sites using the system selected, if possible. Visits should include interviews with representatives from HIM departments to identify advantages and disadvantages realized and surprises (both pleasant and problematic) encountered during installation.
- **HIM Project Plan:** Based on the organizational project plan for implementing the EHR system, develop a comprehensive HIM department project plan of actions, milestones, and rollout (go-live) dates for implementation of the EHR system.

    - The HIM department plan must include every step involved in the migration to the proposed system. There must be concrete dates for the completion of all tasks required and clear assignment of responsibility for each step.

        - When developing the plan, consider the rollout plan for the organization. Will the proposed system begin with all patients seen, treated, admitted, or discharged on a specific date, or will the transition be according to document type?
        - Determine executive-level support that will review, approve, and fund work of the migration project.
        - Oversee development of forms and clinical documentation templates and views.
        - Consider using a certified and experienced project manager.

- **Change Management:** Develop strategies for culture shift that will accompany the implementation.

    - Consider the inherent resistance by staff and physicians to the change. Include managing expectations of staff and physicians in the strategy.
    - Anticipate dealing with physicians and others who may refuse to participate in electronic documentation processes. Develop scripting that can assist departmental staff in difficult discussions with resistant physicians or staff.

- Identify EHR physician, nurse, and departmental champions who can assist with the change, communication strategy, and rollout.
- Consider use of techniques for visioning the future of the HIM department with staff to help them understand the future of the work they do. See the article "Visioning e-HIM: A Process for Imagining-and Anticipating-HIM's Future," available in AHIMA's HIM Body of Knowledge.
- Consider implementing a keyboarding or computer class for all employees well in advance to prepare them for training on the EHR.
- Consider developing and administering a survey for input to determine readiness of clinical staff.

- **Communication Plan:** Develop a communication plan that keeps staff and organizational leaders updated with a clear understanding of the status of the HIM department's plan for migration to the EHR.

    - Regularly address concerns and issues that may affect the rollout of the project and steps that are being taken to remedy potential delays.
    - Identify responsibilities for communications about the status of the departmental project.
    - Update the HIM department staff regularly about organizational progress toward the implementation date.

- **Staffing Plan:** Develop a staffing plan for the implementation of the EHR.

    - Estimate the hours required to carry out each task, once implementation tasks have been identified.
    - Consider paying a bonus to staff members whose jobs will disappear as part of the migration so they will continue their employment through the time when their jobs end so that qualified staff members are retained to perform tasks required during migration.
    - Plan for temporary or part-time staff members who may be required to conduct simultaneous, regular departmental business and the additional tasks required for migration activities. Review the practice brief "e-HIM Practice Transformation," available in the AHIMA's HIM Body of Knowledge.

- **Education Plan:** Develop an education plan on new or changed processes for both the HIM department and other organizational staff and physicians. Consider the use of letters, posters, videos, intranet sites, brown-bag sessions, demonstrations in physician and clinical lounges, fliers, and e-mail. Messages may include information about specific changes and how to perform required tasks.
- **Gap Analysis:** Prepare a functional analysis comparing the current and proposed systems. Evaluate the results of the current and proposed EHR solutions. The analysis should compare all required functionality in the current paper-based or hybrid health record system with the proposed system.

    - Document where the proposed system functionally does and does not match the current system.
    - For detailed information, see the practice brief "The EHR's Impact on HIM Functions," available in AHIMA's HIM Body of Knowledge.
    - Study any current functions that are not accommodated in the proposed system. Determine whether there will be a need for the function in the future or whether the outcome of the current function will be available in a different way.
    - If the function must continue and is not part of the proposed system, identify whether new software or hardware be will be needed or a manual process will continue.
    - Determine if existing or new software or hardware can be interfaced with the proposed system, if necessary. Identify costs incurred and funding needed.

- **Workflow:** Develop or update comprehensive HIM department workflows and processes that will be affected by migration to the new system. Review the process workflows and consider appropriate steps to reengineer and redevelop them.
- **Policy and Procedures:** Develop policies, processes, and procedures for the migration. Processes should include detailed processes required throughout the conversion from paper-based documents to the electronic format.
- **Contracts:** Review contracts for current and future HIM department functions (such as overflow transcription, coding, release of information), as well as contracts for hardware and software. Determine if contracts will be maintained and whether changes are needed to support migration to the proposed EHR system. Lack of compliance with contract timelines for amendments can be costly and may result in unnecessary chaos for all involved.

- **Training:** Identify training requirements for HIM staff.
    - Develop plans for training staff to learn new functionality in the selected system.
    - Offer career counseling and training, as appropriate, for new jobs that may emerge for staff members whose jobs will change significantly or disappear during the migration to the EHR.
- **Budget:** Plan the budgetary effect of the migration. Clearly identify, budget, and obtain funding for items such as hardware, software, remodeling, training, information security, and replacing or augmenting staff during migration. If contract alteration or elimination for software or hardware will result in costs, enumerate them.

Regulatory and Accreditation Requirements

Consider federal and state laws, as well as regulatory requirements (e.g., defining the electronic record, retention of records, electronic signatures, requirements of the legal electronic record, etc.).

- **State Regulations**: Research applicable state and federal regulations (e.g., defining the legal electronic record, retention of records, electronic signatures) and accreditation standards such as Joint Commission standards (e.g., standard IM.2.20 addresses data integrity, IM.2.30 addresses continuity and disaster recovery for both hard-copy and electronic records) and the Commission on Accreditation of Rehabilitation Facilities.
- **Federal Regulations:** Research federal laws (e.g., HIPAA, Privacy Act of 1974, if they apply to the organization, and the Health Information Technology for Economic and Clinical Health [HITECH] Act).
    - Review the Federal Rules of Evidence, Article VIII. The EHR should meet the federal and state rules of evidence to stand as a legal business record. Review the practice brief "Maintaining a Legally Sound Health Record," available in the AHIMA's HIM Body of Knowledge, for a summary of the rules of evidence.
    - Research applicable Food and Drug Administration regulations, including 21 Code of Federal Regulations (CFR) 11: Electronic Record and Electronic Signatures, Food and Drug Administration Guidance for Industry: Computerized Systems Used in Clinical Trials, and 45 CFR 46: Protection of Human Subjects.
    - If appropriate to your facility, review the applicable federal conditions of participation (e.g., defining the electronic record, retention of records, electronic signatures), including:
        - 42 CFR 2: Conditions of Participation for Drug, Alcohol, and Substance Abuse
        - 42 CFR 418: Conditions of Participation for Hospices
        - 42 CFR 482: Conditions of Participation for Hospitals
        - 42 CFR 483: Conditions of Participation for Long Term Care Facilities
        - 42 CFR 484: Conditions of Participation for Home Health Agencies
        - 42 CFR 485: Conditions of Participation for Rehabilitation
- **Network:** Seek out professional peers who may be working through this same issue in the local community, as well as your state and national communities. Join different AHIMA Communities of Practice (e.g., e-HIM, Enterprise Imaging, HIPAA: Computer-based Patient Record).
    - Join the customer forums on your vendor's Web site, if available, to communicate with other similar facilities.

Form Identification and Transition

Investigate issues regarding format in the proposed system. Forms bring special challenges for most EHR implementations, and development of and adherence to forms standards are critical to the success of implementing an EHR. The appearance of electronic versions of forms can contribute greatly to the success or difficulty of transitions to the EHR.

- **Format:** Consider the following questions regarding format:
    - Consider before-and-after formats comparing the paper document to the computer-generated document. Is there a comparable electronic version of each document?

- Will the organization realign roles and responsibilities for existing committees (e.g., will the forms committee approve the format of the electronic record)?
- How should the record be organized?
- Is the information in the record organized for efficient retrieval of needed data? Is it readable?
- Can the record be brought to paper in a readable format?
- Are there customizable views for different groups of users (e.g., clinical view, HIM view, audit view)?
- If alerts and reminders are part of a legal medical record, are they viewable? Printable?
- Plan for auditor access to the record online without the ability to see or search for other patient records an auditor is not privileged to view. How will the auditor be trained to use the system?
- How will staff members be trained to read through the online record to find information?
- If copies need to be printed out of the system, ask if the system can label print reports to include a prominent watermark or label with information about disposing of the copy or print the report on colored paper.
- How will the organization integrate paper from outside the facility? Will it be scanned immediately or kept in a temporary paper folder for a time?
- Determine if paper forms scanned at discharge or clinical documentation templates (or views) will be used. Will a combination of scanned paper and clinical templates be used?
- If an inventory of forms does not already exist, create a list of chart forms already in use. Involve other departments, such as nursing, in this process.
- Determine which forms will no longer need to be multipart after implementation of the EHR.
- Determine which reports may be COLD-feeds to the EHR (e.g., laboratory and radiology results, dictation, and electrocardiographic images).
- Determine if bar codes or optical character recognition will be used.
- Collaborate early and often with nursing managers, unit and ward clerks, and ancillary department managers.
- Collaborate with the printer to transition forms to electronic formats (e.g., TIFFand PDF).
- Prepare a list of all electronic systems currently in use and definitions of the reports that are generated from these systems. Ensure that the data captured in existing forms and used in reports will be captured in the EHR.
- Pay attention to the format of forms in both online and printed states. Placement of bar codes (if used) should be consistent to minimize disruption. Margins should be appropriate for the form.
- For printed formats, black ink should be required. Colored paper forms and use of Addressograph should be eliminated (due to poor reproducibility) as early as possible in the migration.

- **Patient Information Matrix:** During the transition, consider developing a grid or matrix that describes where and how to find specific document types (e.g., history and physical examination forms, operative reports, discharge summaries, physician orders, test results). Review the practice brief "Managing the Transition from Paper to Electronic Health Records," available in AHIMA's HIM Body of Knowledge.

Policies and Procedures

- **Policy and Procedure:** Consider the following issues related to policy and procedures:

  - Do organizational policies need revision in response to issues identified with going paperless?
  - Address retention for electronic records. It is critical to verify how long documents or data are readily available from various systems. Do the electronic data go away after a couple of years? How long will data be kept online? After archiving, how will the data be retrieved?
  - If a record must be thinned, how will the organization go about it? How will this information be retrieved?
  - What is the downtime (manual backup system) policy and procedure? Will documents completed while the system is down be part of the legal medical record? Will they be scanned into the record?
  - Will printing be restricted? Unrestricted printing means the organization is not paperless. Determine where copies may be printed in the organization and methods to be used for copy disposal. Will there be an audit trail to identify users who have printed reports from the system?
  - How will access to the systems be addressed for staff members and physicians (staff and non-staff)?
  - How will privacy and security issues be addressed?

Content and Data Integrity

Comprehensively evaluate HIM department responsibilities and functions related to the content of the EHR. Query each clinical department head to determine if any medical devices or instruments are in use in their area but are not interfaced with the EHR. Health records in every state still require business processes such as a determination of when the record is complete, whether transcribed documents will be displayed in the EHR before sign-off, how amendments or corrections are made, and when co-signatures may be required.

Considerations to assess EHR functionality and areas to be addressed by HIM policy include the following:

- Is the patient identification obtained and embedded in each document in the EHR, and is it being done according to facility policy (e.g., the organization's master patient index has an algorithm to determine accurate patient identification or devices or other data-capture mechanisms require complete and accurate patient identification)?
- Can patient information be accessed and retrieved efficiently and legibly?
- Does documentation indicate the exact date and time of the recording of the event and the name of the documenter? Is this information viewable? Printable?
- How will versioning of the electronic record process work? How will the original unaltered version and edits be maintained? How can the organization tell whether the report has been edited? Will the organization be able to retrieve it?
- How long after an entry has been made can the documentation be corrected or amended? Amendment rules should be similar to those for paper records. The change, date and time, and author of the change should be viewable and printable.
- The rule for correcting data and reports should be the same for paper and electronic systems. Evidence of the correction with the date and time and author of the change should be viewable and printable.
- If a patient requests an amendment or correction, how will it happen in the EHR system? Will the information be scanned or imported as a text file into the record?
- How will the organization know the record is finalized or completed on the system? Paper or paperless, record completion business processes still will be needed. How will temporary documentation (e.g., preliminary findings, draft reports, unsigned and authorized reports) be identified clearly?
- What is the data validity and completion process?
- Will physicians complete records online? How will they know to do that? Will they be given a break on suspensions during the learning curve and still be in compliance with Joint Commission standards?
- Will the EHR system allow electronic signatures that meet state and federal laws? Is the signature viewable? Printable?
- Will the EHR system allow required co-signatures (e.g., students, residents, nurse practitioners)? Is the signature viewable? Printable?
- How will documentation reviews be performed (e.g., medical record reviews)?
- Have individuals who do data abstraction, utilization review, or auditing been trained to identify where to find information?

Privacy and Confidentiality

Strong privacy programs are required as EHR systems are implemented, taking into account federal and state laws, including e-discovery, to ensure appropriate access, use, and disclosure of health information. Sound privacy and confidentiality practices lead to more effective management of health information, contributing to safe, high-quality patient care.

- Evaluate the privacy and confidentiality of the selected system for compliance with organizational and HIM department policies and procedures. Revise as appropriate.
    - Review HIPAA, state, federal, and accreditation requirements to ensure compliance with privacy and confidentiality requirements.
    - Review organizational and departmental policies regarding patient access to health records, release of information, clinical access to protected health information, and document compliance with the EHR system selected.
- Consider the following confidentiality issues:

- Will patients have online access to their medical records? If not, the organization will have to print the record for their review.
- How will the release of information be completed? Can the record be attached to an e-mail, faxed, stored on a CD, or printed? Review HIPAA requirements.
- Is the system HIPAA compliant?
- Should nurses and other caregivers be restricted to viewing information for only the patients on the unit where they are assigned?
- What about physician access to records when he or she is not recorded as a treating physician (e.g., consultants, referring physicians, physicians doing committee reviews, researchers)? Can any physician on staff have access to any patient record?

Consider the needs of privacy and security when data from the EHR are exchanged beyond the confines of the organization (e.g., HIE or across the continuum of care).

- What responsibility will the HIM manager have regarding HIE?
- What policies and procedures will be included in the consent management process?
- Investigate the federal and state requirements on transfer of data between providers.
- Investigate accreditation requirements.
- Educate staff on transfer of data policies.
- Consider meaningful use privacy and security provisions such as patient access to protected health information in electronic format, notification of breaches, restrictions for disclosure to services paid out of pocket, etc.

Hardware and Software

- Define your organization's hardware platform. For example, is the organization using a high-availability platform or a stand-alone platform? Is there a redundant or mirrored database? Is there a system server?
- Define the backup processes, including media, retention, restoration of files, and rotation cycles. Test the processes on a periodic basis.
- Define the disaster-recovery processes and the acceptable downtime.
- Be aware of your organization's hardware and software maintenance windows, as well as hardware and software upgrades.
- Determine whether there is sufficient hardware available to carry out organizational and HIM department functions.
    - Plan for EHR access by physicians, nurses, other caregivers, and all nonclinical personnel, such as reviewers, with the need for access.
- Determine if remodeling will be required to accommodate necessary hardware.
- Manage the hardware and software budget for the department (e.g., additional printers, supplies, workstations, software licenses).
- Determine which hardware and software are required to support HIM department functions outside the scope of the proposed EHR system.
    - Determine whether existing hardware and software external to the EHR system are compatible with the proposed platform and software.
    - Ensure that contracts are reviewed and amended appropriately.
- Document system downtime for backup, upgrade, and disaster-recovery processes.
    - Define acceptable times for system backups and upgrades.
    - Ensure that HIM staff members are aware of downtime procedures.
    - Participate in regular disaster recovery process testing to ensure that data recovered are complete and accurate.

Security and Risk Management

- Conduct a comprehensive risk assessment, taking into consideration best practices as defined by the National Institute of Standards and Technology, HIPAA, and HITECH.
- Develop an overall security management framework.
- Once systems are implemented, conduct a security audit to determine the security state.
- Document roles and responsibilities and access rights.
- Determine best methods for access and identity management.
- Take into consideration securing all levels of data, including data at rest, data in motion, data used, and data disposed.
- Consider revising business associate agreements, adding security expectations as defined by your organization's security management framework.

Interfaces

- Plan for interfaces for any system or device that is not part of the EHR.
    - Is there an interface for the master patient index to the EHR system so that medical record numbers merged in the index will be merged automatically in the EHR system? Or will staff members have to go in and out of different systems to keep the medical record numbers accurate?
    - Is the interface unidirectional or bidirectional?
    - Ensure that the frequency of data transfers is appropriate to the function (e.g., the master patient index should be updated in real time, not in batch mode).
    - Document reconciliation processes after system downtime.
    - Develop processes to ensure that changes in the master patient index are reconciled in the EHR. If manual processes are required, only a small number of persons should be involved in making changes.

Lessons Learned

As the saying goes, "experience is the best teacher." Here are some lessons learned by other HIM professionals as they have made the transition from a paper-based system to an EHR:

- Take the time to visualize the workflow of all HIM functions supporting a paperless health record. You will experience a number of aha moments. This is critical to the planning phase. To be successful, you will have to map the transition from paper to paperless by carefully considering all the changes that may or will occur. Encourage your staff to assist you in this visualization process. Continuously asking "what if?" will allow you to discover many of the important issues during the planning stage.
- During the planning stage, identify which clinical data will be needed for any population reports. Be sure these data are being discretely populated in the EHR. Often, the report desired cannot be generated because the data were not captured, stored, or retained for that purpose. There are many instances in which the HIM department or other departments maintained logs of patients; each of these logs should be able to be created and maintained as part of the population reports.
- It will be equally important for other members of the implementation team to visualize the changes in their workflows. HIM professionals can provide invaluable insight for the clinical team members in assisting them to consider all issues affecting the clinical workflow and going paperless.
- If the record is moved from the active database to an archival database, check that all of the record is retrievable in the same format and does not require special programming to retrieve or print it.
- Be actively involved in testing the backup. Do not wait until the system has crashed and needs to be restored to find out that the backup does not work adequately.
- When implementing a new electronic record system, do not forget to have the project plan include the printing of all reports. Some systems are sold as paperless and do not have reports developed to be printed out of the system if necessary.
- When a new data element is created in the system, make sure that the new information is viewable and printable. Some systems take additional programming to get the new data into a viewable or printable format.
- If you are going paperless in several different systems (e.g., radiology, physician order entry), evaluate the hardware needs in each department to ensure that all staff members can access the system as appropriate to their job functions. Some systems have licensing limitations and could cause access restrictions.

- Ensure that system updates occur on the server and do not require manual intervention on each computer or desktop. Imagine having to visit every computer or user each time a change is made. Likewise, verify that one installation grants application access to all profiles on that computer.
- Many forget about security during a large-scale project such as an EHR implementation. Keep security as part of the entire process to determine its current state, what will need to be in place in the future, and then ultimately validating that the environment is secured.

For additional references, review AHIMA's practice briefs available in AHIMA's HIM Body of Knowledge.

References

For additional resources, seek out professional peers working through the same issues. Review the e-HIM practice briefs and search AHIMA's HIM Body of Knowledge. Join AHIMA's Engage community to explore topics online further with other HIM professionals.

All references are available online in AHIMA's HIM Body of Knowledge.

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