

The Strategic Importance of Electronic Health Records Management

More than ever, the healthcare industry is making significant progress in the quest for electronic health records (EHRs), which will improve the quality and safety of patient care and achieve real efficiencies in the healthcare delivery system. Emphasis has been placed on intelligent systems that support the care process and clinical decisions as well as the creation of health information for patient care.

From a strategic standpoint, it is important to go beyond the information creation phase and develop a plan that results in an EHR and EHR system that maintain a high level of integrity for business and legal purposes. The management of the EHR and the EHR system is and will continue to be a mission-critical function in the provision of care across the healthcare continuum. However, in today's urgency to begin deploying EHRs, healthcare entities, vendors, and others sometimes neglect to build in the processes and system capabilities needed to enable optimal EHR management functions and ensure the electronic rather than the paper version can stand as the legal business record.

Traditional business and health records management concepts and processes must be evaluated and applied in this relatively new world of EHRs. Business process redesign and an understanding of the change management process are fundamental to this activity. Healthcare organizations need to analyze and assess all downstream uses of EHRs and see those uses reflected in requests for proposals, system selection, development, installation, and implementation in order to ensure that all needs of the organization are met.

Definition of Electronic Health Records Management

Electronic health records management (EHRM) is the process by which electronic (e.g., digital) health records are created or received and preserved for evidentiary (e.g., legal or business) purposes.

An electronic record includes information that is:

- Recorded on any electronic medium (e.g., magnetic medium)
- Intended to provide documentation for long-term retention that has legal or business evidentiary value
- Potentially produced in response to a subpoena duces tecum

EHRM requires decision making and planning throughout the entire life cycle of the EHR—from planning, processing, distribution, maintenance, storage, and retrieval of the health record to its ultimate disposition, including archiving or destruction. Decision making includes, but is not limited to, what EHRs to keep and for how long, the assignments of authorities and responsibilities, the design and administration of the process, and the audit and review of the process's performance. In the early phases of EHRM system development, it is important to make critical decisions about the role and use of paper and film to avoid the dilemma of maintaining dual systems.

Roles and Responsibilities

HIM ensures the availability of clinical, demographic, financial, and administrative data to facilitate real-time healthcare delivery and critical health- and business-related decision making for multiple purposes

across diverse organizations, settings, and disciplines. HIM professionals are ideally suited to provide the healthcare entity with the necessary leadership to ensure that the EHR and the EHR system are optimally managed.

As the traditional custodian 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 standards are consistently applied across these various systems in order to maintain the level of integrity necessary for the healthcare organization's records.

The evolution from a paper-based medical record model to an EHR model has opened up many avenues for HIM experts to apply and share their core competencies, knowledge, and skills. Advanced technologies and systems make it possible for HIM practitioners to fulfill roles such as patient advocate, data translator, and public health officer.

The e-health environment encompasses much more than the storage and retrieval of information. It places new demands on the HIM professional to assist the consumer in healthcare across the continuum of care. As a patient advocate, HIM practitioners have a vital role and responsibility in the use of patient portals for e-mail, personal health records, scheduling healthcare appointments, completing patient health questionnaires and surveys, and transferring electronic clinical information. HIM practitioners play a role in working toward the exchange of healthcare data among providers, healthcare professionals, and patients. Other traditional patient advocate responsibilities, such as protecting patient privacy, maintaining confidentiality, and promoting and enhancing public policy, will continue to be a critical HIM responsibility.

HIM professionals have long been translators of clinical data for their business and financial offices through their clinical expertise, understanding of documentation, and coding functions. Now is the time for HIM practitioners to share their knowledge with healthcare consumers in the role of data translator. 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 e-health environment is, therefore, increasing the ability of 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 in providing 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 of health information in the public health sector has been gaining importance such that we may, in fact, say that these activities are already underway and can be fully supported by the EHR.

The EHR and EHRM are expanding the roles and responsibilities of HIM practitioners. Legal, regulatory, and accrediting environments will need to adapt to the emergence of new technologies and applications in healthcare, and so the traditional leadership role of HIM will continue to influence and adapt the management of health information.

[Checklist for Transition to the EHR](#)

Additional Material

While 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. These considerations are included in the online appendix to this practice brief.

[Appendix A: Issues in Electronic Health Records Management](#)

References

AHIMA. "A Vision of the E-HIM Future: A Report from the AHIMA E-HIM Task Force." 2003. Available online at www.ahima.org.

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The Strategic Importance of Electronic Health Records Management: Checklist for Transition to the EHR

This checklist assists in the transition from paper to an electronic health record (EHR) as a legal medical record. Whether paper or electronic, the system must meet certain standards to be considered a legal business record. This checklist will help your organization with the preparation for going paperless and ensure that when you do, you can get rid of the paper.

Once the decision to move to an EHR system is made, organizations must address the change in culture for going paperless. If an organization embraces technology fully, this may be an easy task. If an organization has deeply embedded traditions, this task may be quite arduous. However, if organizations do not fully embrace the change, the migration to an EHR system will be destined to fail.

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

Getting Started

- Form an executive-level committee (ELC) to review and approve the change to a fully electronic system. Obtain executive-level support that will review and approve the migration.
- Form an organizational-level committee, 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.
- Review and revise your legal health record policy. This should be a comprehensive policy that describes each step involved in the transition. This may mean planning for a hybrid environment (both paper and electronic).
- Develop a comprehensive plan of actions and milestones that details each step involved in the move to a fully electronic system. This plan should contain a definitive date for the completion of the migration and should detail individual departmental or divisional rollout dates.
 - Consider the following when setting the date and defining the process: 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 you transition all areas of the organization at once or individually? Will you transition by unit or by document type (e.g., lab 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 workflows.
 - After an organizational review of these data maps, consider appropriate steps to re-engineer and redevelop workflows as appropriate.
 - Develop comprehensive processes and procedures that address the conversion of paper-based documents to an electronic form.
 - 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 non-clinical 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.
- During the transition, consider developing a grid or matrix that describes where and how to find specific document types (e.g., history and physical exam forms, operative reports, discharge summaries, physician orders, test results). Review the practice brief “The Complete Medical

Record in a Hybrid EHR Environment,” available in the FORE Library: HIM Body of Knowledge at www.ahima.org.

Research

- Research state regulations (e.g., defining the electronic record, retention of records, electronic signatures).
- Research applicable accreditation standards:
 - Joint Commission on Accreditation of Healthcare Organizations 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)
 - Commission on Accreditation of Rehabilitation Facilities
- Research federal laws (e.g., HIPAA and the Privacy Act of 1974 if they apply to your organization).
- Review the Federal Rule 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,” also available at www.ahima.org, for a summary of the rules of evidence.
- Research applicable FDA regulations:
 - 21 CFR 11: Electronic Record and Electronic Signatures Regulation
 - FDA Guidance for Industry-Computerized Systems Used in Clinical Trials
 - 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).
 - 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 Rehab
- Seek out professional peers who may be working through this same issue in your 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).

Content Issues

- Consider the following issues related to content:
 - Can patient information be efficiently and legibly accessed and retrieved?
 - 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 you tell whether the report has been edited?
 - How long after an entry has been made can the documentation be corrected or amended? Amendment rules should be similar to those in the paper world. 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 you know the record is finalized or completed on the system? Paper or paperless, record completion business processes will still be needed. How will temporary documentation (e.g., preliminary findings, draft reports, unsigned and authorized reports) be clearly identified?

- What is the data validity and completion process?
- Will physicians complete records online? How will they know to do that? Will you give them a break on suspensions during the learning curve and still be in compliance with the Joint Commission?
- Will the EHR system allow electronic signatures that meet state and federal law? 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?

Format Issues

- Consider the following issues regarding format:
 - Consider before and after formats comparing the paper document to the computer-generated documentation. Is there a comparable electronic version of each document?
 - Will you 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 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 printed reports to include a prominent watermark or label with information about disposing of the copy or print the report on colored paper.
 - How will you integrate paper from outside the facility? Will it be scanned immediately or kept in a temporary paper folder for a period of time?

Policy and Procedures

- 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 is readily available from various systems. Does the electronic data go away after a couple of years? How long will data be kept online? After archived, how will it be retrieved?
 - If a record must be thinned, how will you 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 you are not paperless. (For a discussion on the pros and cons of printing, see the practice brief “The Complete Medical Record in a Hybrid EHR Environment. Part III: Authorship of and Printing the Health Record.”)

- 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?

Confidentiality

- Consider the following confidentiality issues:
 - Will patients have online access to their medical records? If not, you will have to print the record for their review.
 - How will the release of information function 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 only the patients on the unit where they are assigned?
 - What about physician access to records when they are 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?

Hardware

- Define your hardware platform. Are you using a high-availability platform or a stand-alone platform? Is there a redundant or mirror database or system server?
- Define the backup process, including media, retention, and rotation cycle. Test it.
- Define the disaster recovery process and the acceptable downtime. (There will be system maintenance windows or system upgrades.)
- Is there enough hardware available for access? Plan for access points across the facility for physicians, nurses, all caregivers, and non-clinical reviewers.
- Consider budgetary issues for your department (e.g., additional printers, supplies, personal computers).

Interfaces

- Plan for interfaces (e.g., lab, ADT, radiology). How often is information transferred to other systems? What is the reconciliation process?
- Is there an interface for the master patient index to the EHR system so that medical record numbers merged in the index will be automatically merged in the EHR system? Or will staff have to go in and out of different systems to keep the medical record numbers accurate?

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 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 “a-ha!” moments. This is critical to the planning phase. To be successful, it will be necessary 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 what clinical data will be needed for any population reports. Be sure this data is being discretely populated in the EHR. Often, the report desired cannot be generated because the data wasn’t captured, stored, or retained for that purpose. There are

- many instances where 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 workflow. HIM professionals can provide invaluable insight for the clinical team in assisting it 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 doesn't require special programming to retrieve or print the record.
 - Be actively involved in testing the backup. Don't wait until the system has crashed and needs to be restored to find out that the backup doesn't work adequately.
 - When implementing a new electronic record system, don't 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 hardware needs in each department to ensure that all staff 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.

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For additional resources, seek out professional peers working through the same issues. Review the e-HIM practice briefs and search the FORE Library: HIM Body of Knowledge. Join AHIMA Communities of Practice such as e-HIM, Enterprise Imaging, and Computer-based Patient Records.

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The Strategic Importance of Electronic Health Records Management.

Appendix A: Issues in Electronic Health Records Management

Electronic health records 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 electronic health record'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 what electronic health records to keep and for how long, the assignments of authorities and responsibilities, the design and administration of the process, the integrity of the data, and the audit and review of the process's performance.

Document/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 ensure the chart is in the order specified in the supporting procedure prior to filing.	<p>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.</p> <p>As the need to print and assemble paper-based records diminishes, HIM management needs to 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).</p> <p>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).</p>	<p>Record order may continue to be important to HIM once a totally electronic format is achieved.</p> <p>If scanning documents continues to be part of the EHR, the processing of the documents prior to scanning, indexing, display, storing, and destruction will be an essential function.</p> <p>Format and access should be defined according to the information system chosen and the user's need for protected health information relative to his or her job for both display and print capabilities.</p> <p>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).</p>

Workflow Changes		
Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
Written policies list the reports required to signify	Consider electronic rules and alerts on ROI requirements to allow for	Consider electronic rules and alerts on ROI requirements to allow for

<p>the record is complete and ready for purposes such as coding, release of information (ROI), and meeting the organization's legal definition. HIM staff follow written procedures to review each record received in the department.</p> <p>Forms inventory is critical, as is forms design for efficient capture of information.</p>	<p>expanded delegation of ROI operational capabilities and responsibilities.</p> <p>Develop policies for disclosure tracking and auditing capabilities.</p> <p>Determine whether ROI will remain centralized in HIM or be decentralized.</p> <p>Ensure that the organization has care-fully planned EHR content and access prior to moving coding or transcription functions off-site(e.g., will coders require online access to clinical documentation, such as doctors' progress notes?).</p> <p>Forms inventory and design becomes even more critical at this phase, as efficient processing (scanning, indexing, and online review) is predicated on effective forms management.</p> <p>Define when the record is complete for coding purposes (e.g., what reports will be available to coders and in what format, paper or electronic).</p>	<p>expanded delegation of ROI operational capabilities and responsibilities.</p> <p>Develop policies for disclosure tracking and auditing capabilities.</p> <p>Determine whether ROI will remain centralized in HIM or be decentralized.</p> <p>Ensure the organization possesses appropriate access to EHR content prior to moving coding or transcription functions off-site.</p> <p>Define when the record is complete for coding purposes (e.g., must specific reports be available to coders prior to coding?).</p> <p>Forms management and control are essential so that manual processing is avoided and the EHR can be legally upheld without disruption of "unofficial" forms.</p>
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Record Completion		
Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
<p>Written procedures outline deficiencies to look for when reviewing the different record types (e.g., IP, ER).</p> <p>Each record is reviewed for presence or absence of reports requiring necessary signatures.</p> <p>If using an automated deficiency system, deficiencies are manually entered into the system for tracking and notification that completion is</p>	<p>Written procedures outline deficiencies to look for when reviewing the different record types (e.g., IP, ER).</p> <p>Review and consider e-signature processing capabilities, limitations, and opportunities for electronic portions of the EHR.*</p> <p>Determine if the vendor can automate deficiency analysis.</p> <p>Establish business rules for viewing the EHR based on an individual's role and the completion status of a document (e.g., should ROI staff see</p>	<p>Written procedures outline deficiencies to look for when reviewing the different record types (e.g., IP, ER).</p> <p>Review and consider e-signature processing capabilities, limitations, and opportunities for electronic portions of the EHR.*</p> <p>Determine if the vendor can automate deficiency analysis.</p> <p>Establish business rules for viewing the EHR based on an individual's role and the completion status of a document (e.g., should ROI staff see</p>

necessary.	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)	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)
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*Consolidated Health Informatics. "Standards Adoption Recommendation." Available at www.whitehouse.gov/omb/egov/downloads/multimedia_1_full_public.doc.

Filing		
Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
<p>Records are filed in folders, and each is assigned a patient-specific number. Organizational policy should define the medical record numbering system utilized.</p> <p>Policy defines where and how records are stored. Retention schedule is included in the policy.</p> <p>Policy outlines handling and storage of incomplete records, as well as when the record is considered complete for permanent filing.</p>	<p>Determine what 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:</p> <ul style="list-style-type: none"> • Functions and tasks • Hours of operation • After-hours access and backup • Staffing needs • Record control • Filing/indexing • Retention, purging, archiving 	<p>Review file room staffing and need to reduce or redefine staff as the record becomes fully electronic.</p> <p>Determine whether any of the paper record will be converted to electronic format or will paper records be phased out over time as a result of retention and purging policies.</p> <p>Establish policies and procedures to outline the management of remaining paper records.</p>

Locking the Record		
Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
<p>Written policies and procedures define when the record is complete and permanently filed (e.g., all loose reports filed, deficiencies complete, coding is done)</p>	<p>Written policies and procedures define what part of the record is kept as paper and what is electronic.</p> <p>Policy also defines when both paper and electronic portions of a hybrid record are considered complete (e.g., no additional HIM processing is required, all reports are complete).</p>	<p>Written policies and procedures define when a record is considered complete (e.g., no additional HIM processing is required, all reports are complete).</p> <p>Policy must indicate at what point electronic documents are locked and available as read-only. Any subsequent additions, changes, or deletions are handled as addendums to the record. Software must have the ability to insert a record document in</p>

	<p>Complete records are locked and available as read-only. Any subsequent additions, changes, or deletions are handled as addendums to the record.</p> <p>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 an electronic and manual signature on the same or different versions of the document.</p>	<p>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.</p>
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Report Capabilities		
Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
<p>Data is abstracted from medical records and manually entered into abstracting software.</p> <p>Depending on capabilities of the abstracting software or other information system, reports may be available from this data electronically. If no electronic reporting capability exists, reports may be prepared using data from printed reports produced by the system.</p>	<p>Report-writing software may be available that will pull data from the abstracting and other systems.</p> <p>There may also be predefined (e.g., standard or "canned") reports available that are part of the electronic portion of the medical record.</p>	<p>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.</p> <p>Flexibility in report functionality (such as graphing) is a major asset.</p> <p>Predefined (or standard) reports can be developed for routine reporting.</p>

Version Control
<p>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 as to whether both versions of the document need to be available must be made.</p> <p>HIM departments have long had to determine whether or not to retain older versions of documents in the complete medical record. (Laboratory, for example, often has multiple versions of test results from the initial preliminary result until the final result is available.)</p> <p>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</p>

approved process.

Every organization should determine the capacity of their medical record 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 must be able to access them if needed.

Policy and procedure are also 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 be 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 version 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 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 and information. Reconciliation ensures that data is 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 electronic health record.

The focus on timely reconciliation processes has accelerated with the advent of the electronic health record. 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 moved 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 impact of timely, quality information are necessary traits for successful implementation and maintenance of the electronic health record. 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	<p>Verify that a record exists for each discharge.</p> <p>Verify correct patient type registered (e.g., inpatient, short stay, observation status) to ensure accurate billing.</p>	Same with addition of monitoring canceled admits.	Same

<p>Emergency Department, Outpatient, and Clinic Visits</p>	<p>Verify that record exists for every registration.</p> <p>Verify correct registration of multiple visits in one day according to APC regulations.</p>	<p>Same with addition of monitoring canceled admits.</p>	<p>Same</p>
<p>Interface Engine</p>	<p>No</p>	<p>Monitor at least daily interface engine logs for failed reports.</p> <p>Research and correct documents that fail to cross an interface between disparate computer systems (e.g., stand-alone transcription system to an EHR).</p> <p>Ensure that documents are posted to the correct encounter and are in the correct location.</p> <p>Verify that content remains constant when moved from one system or database to another.</p> <p>The extent of reconciliation increases with the number of disparate computer systems.</p>	<p>Same</p>
<p>MPI and EMPI</p>	<p>Correction of duplicate patient name and number entries by accurately matching patients to paper records.</p> <p>Ensure match to all computer systems (e.g., lab, radiology, pharmacy, billing).</p> <p>Correct other or duplicate names in system (e.g., legal guardian names) through verification of secondary matched data elements.</p>	<p>Same issues as in the paper-based record.</p>	<p>Same issues as paper-based and hybrid records. The EHR may be able to automatically identify components of records in other electronic systems and provide notification of changes.</p>
<p>Inbox Maintenance</p>	<p>None</p>	<p>Monitor unopened mail and incomplete documentation (e.g., unsigned dictations, un-reviewed results, and</p>	<p>Same</p>

		documents copied to others that have failed).	
Auto-faxing Files and Automatic Data Transfers	Monitor transcription systems for failures of sent documents. Periodically validate fax numbers and that remote fax machines are located in secure locations.	Expanded monitoring including voice recognition and direct charting.	Expanded to include transfer of EHR files for ROI, download of EHR data to patient personal health records, and community-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 is captured following downtime through direct entry or scanning.	In addition to more detailed and lengthy post-downtime data capture, ensure that data flows to data warehouse or other repository in a timely manner and in the correct sequence. Track legal EHR variations from 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 EHR or ensure amendment made online adheres to the agreed upon amendment process.

Managing Other Types of Records and Data

HIM expanded into electronic health records management in conjunction with the advancement of new technologies. Health records are no longer made up of just discharge summaries, progress notes, physicians' orders, and flow sheets. Electronic reports from the laboratory and pharmacy, e-mail and voice messages containing protected health information (PHI), digital x-rays, digital photographs from the emergency department, 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. Consequently, all electronic information that is generated about patients in healthcare organizations—regardless of the record type and medium—may be classified as part of the electronic health record. As such, all the

different, electronic types of records, such as e-mail and voice mail records, and all the different data types, such as discrete, 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 Records

E-mail

E-mail began as a cryptic messaging system; in other words, the electronic equivalent of the Post-it Note. Today, e-mail has become a record-generating and communication system vital to healthcare organizations' business processes. It has replaced most healthcare organizations' traditional analog communication processes, and it is being used increasingly for a number of non-traditional e-mail activities, such as sending secured, digital reference lab 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 to managing other types of patient records.

E-mail is another type of 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 lifecycle just like any other record. They 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 or data contained in the e-mail require electronic records management.

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). 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 those 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, it behooves healthcare organizations to 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 must also 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 Lotus Notes and 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 appear 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 -out e-mail capture function can be eliminated. In addition, this function can be managed in the background 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. This includes 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 can include issuing an e-mail notification to all authorized users when e-mail records one through 100 for patientname.com are approaching the seven-year retention mark or just 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 represent a negative impact 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 records, e-mail records present a huge opportunity to reduce the risks of enormous legal costs in evidentiary proceedings. On the other hand, its anticipated explosive growth and its 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 and filed in the appropriate folder.	E-mail messages, such as those containing PHI, are printed to paper and filed into appropriate folders.	E-mail messages, such as those containing PHI, are seamlessly integrated into the EHR, where they are indexed and can be searched, retrieved, routed, stored, and purged.

Voice Mail and Phone Messages

Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
Voice mail may be transcribed into a written note for the medical record. Telephone messages or notes may be documented as progress notes or orders that are later appropriately verified by the physician.	Voice mail messages, such as those containing PHI, may be documented as written notes and filed into appropriate folders.	Voice mail messages containing PHI and telephone conversations with patients or providers should be documented in the EHR (e.g., changes in condition, medication, treatment) where they are indexed and can be searched, retrieved, routed, stored, and purged. 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., hardcopy, diagnostic images, cine films, compact discs)

Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
Hard-copy material is incorporated into the medical record per written organizational policy.	Hard-copy material may be scanned into the EHR as dictated in written policies and procedures.	Hard-copy materials are scanned into the EHR following written policies and procedures.

<p>Diagnostic images, cine film, and CDs are reviewed by healthcare providers and may be returned to the originators after making copies if they are deemed necessary.</p>	<p>Depending on the status of the EHR, diagnostic images, cine film, and CDs may become part of the EHR or may be stored in the appropriate department of the facility.</p>	<p>Diagnostic images, cine film, and CDs become part of the EHR.</p>
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Other Types of Data

Free Text

Free text is one type of unstructured data found in electronic health records. Free text data are narrative in nature. 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 hand-write findings and recommendations into analog [e.g., paper] documents). In fact, when users are required to point and click pieces or phrases of information into electronic fields and documents in EHR systems, users 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 easily located on the screens.

Some EHR users like to generate unstructured free text by dictating narrative information into digital dictation or voice recognition systems. Once the information is transcribed by word-processing systems or translated to text by automated voice recognition systems, respectively, 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: Automated voice 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 outputted text data from these systems becomes structured, with predefined and limited fields.)

As such, free text is important in the management of electronic health records.

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 lab 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 to read by other caregivers. 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 voice recognition systems must be carefully integrated 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 7, 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 electronic records management 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.

Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
Hand-written findings and recommendations in analog, paper documents, and forms	Some hand-written findings and recommendations in analog, paper 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 automated voice recognition systems with natural language processing capabilities

Digital Images, Photos, Video and Audio files

The National Committee on Health and Vital Statistics (NCVHS) has identified a Consolidated Health Informatics (CHI) domain to specifically address multimedia standards for federal healthcare organizations.

In the development of a recommendation, the fundamental requirements considered for representing multimedia objects in electronic patient health records included (1) that the objects stored in the patient records are uniquely identifiable persistent entities and (2) 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 DICOM and HL7 committees (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 is necessary to account for problems associated with the migration of information among media bases and are partly due to rapidly changing information technologies.
4. Unique identifiers—Assignment of unique identifiers should be supported in the Integrating the Healthcare Enterprise (IHE) 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.

Authorization and Access Control, Authentication, Nonrepudiation

With the implementation of an EHR comes the dual-edged sword of improved access to patient health information. Used by the right people under the right circumstances, this improved access will lead to better communication between 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.

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

Authorization and Access Control

Access control is the process that determines who is authorized to access patient information in the health record. In paper-based records this is controlled through physical security safeguards, chart tracking, and out guide 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. This 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 it might not be allowed to fax or print the information.

On the other hand, a release of information group would be allowed access to all patient information, both for viewing, printing, and faxing.

Authorization for access to information can also be granted on other criteria besides membership in a group. Items such as terminal address, day of week, or time of day can also 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 can also set the length of system inactivity. The access for nurses on a nursing unit could time out after 10 minutes of inactivity; access for coders should be set for a longer period of time, since coders often must review

numerous documents before determining a code.

Sophisticated EHR systems can limit access by document type or by field in the patient record as well.

Access to information for emergency situations should be considered during the process of defining access. (This is 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 carefully monitored using audit trails within a reasonable period of time following the access.

Authentication

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

Giving the individual a user name and password generally carries out "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 only requires that the user know both the password and user name.)

"Who you are" refers to some form of biometric identification: 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.

It is recommended that at least two of the above factors be joined to produce strong authentication to clinical systems. Users are generally accustomed to a two-factor model, as most bankcards require the purchaser to have a card and use a PIN number or password to complete a transaction.

Organizations will have to find ways to accommodate providers 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 the EHR one time (rather than having to log into every application they are 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 will also 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 should also be authorized to use some type of electronic signature. Rules connected to the application of the electronic signature can cause the notation or document to be "locked." This 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 making the entry or the timing of the entry.

Amendments, Corrections, and Deletions

A key component of records management is the handling of 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 when creating and managing electronic documents in the health record. Refer to ASTM and HL7 guidelines for the technical requirements that should be followed. Organizations must establish policy on amendments, corrections, and deletions within their medical record documentation policies. Policy should delineate the timeframes within which the corrections and deletions will be made, and also, in conjunction with HIPAA compliance policy, outline what is necessary to make amendments to the record. Some organizations allow deletions from the record to occur if the request is made immediately after recording.

For example, if a nurse misrecords a blood pressure recording and realizes it immediately, she can call the section of HIS or IS responsible for deleting values and have the value deleted and corrected right then. Some organizations allow for these types of corrections or deletions to be made up to 24 hours following the keying of the documentation, assuming that few if any persons have used the documentation made in error for subsequent decision making. Type of documentation should also be taken into account. Lab tests, for example, if not corrected immediately, should probably be left intact and marked in error because the possibility that clinicians have used the value for decision making is much more likely. How different data types will be handled should be spelled out in the documentation policy.

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

For 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 event, 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 only attach 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.

Once a document has been amended in any way, the HIPAA requirement to update copies of the document if it has been disclosed must be carried out. This should be covered in policies and procedures of the HIM Department.

	Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
Corrections/ Amendments	<p>Draw a line through the original entry in such a way that the original entry remains legible.</p> <p>Do not alter the original record in any way.</p> <p>Print the word "error" at the top of the entry, sign</p>	<p>Use both the paper and electronic processes, depending upon how your documentation is created.</p>	<p>Corrections must be made in the source system (where it was originally created) as well as in long-term medical record or data repository system.</p> <p>The type of correction should be noted (error, delete, etc) at the top of the entry, signed with</p>

	<p>with name, discipline, date, and time.</p> <p>Indicate the reason for the correction (e.g., incorrect patient).</p> <p>Note the change or addition in proper chronological order</p>		<p>name, discipline, date, and time.</p> <p>Maintain the original incorrect entry or document and add the corrected entry or companion document to it.</p>
Deletions	Nothing is removed from a paper record. Follow the steps as noted above.	Use both the paper and electronic processes, depending upon how your documentation is created.	The computer should be able to hide an original data or document from view and replace it with corrected data 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 and electronic health records. It must also 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 ten years from filing date, upon 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, 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, recognizing 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 format will be destroyed using an acceptable method of destruction after the appropriate retention period. PHI maintained in paper format will be destroyed at the end of the retention period 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. Destroyed by [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 [full name, medical record number, date of admission, date of discharge]

If the records are destroyed using a third-party destruction company, a certificate of destruction should be obtained attesting to destruction of 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. This 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 due 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 due to damage and 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 magnetic bulk eraser. This applies to PC workstations, laptops, and servers.

Compact Disks and Diskettes

Compact disks 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, as computers and media may contain hazardous materials
2. Data stored on the decommissioned computer or media was destroyed per the previously stated method(s) prior to disposal

Methods of destruction and disposal should be reassessed periodically based on current technology, accepted practices, and the availability of timely and cost-effective destruction/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 Web sites, 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 Web site sponsors a means to filter information to meet the unique needs of users based on 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 also providing secure access to an organization's applications, including links to many different 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 easily access 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.

However, unlike clinical workstations, 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 than clinical workstations. 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 by 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. As such, in healthcare organizations with EHR implementations, the portals allowed physicians to easily access the EHR.

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 what other 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 further 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, "back-end" applications, allowing clinicians with proper authorization to easily access pieces of the EHR. 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 easily access the EHR.

Managing Patient Identification

Managing patient, resident, and client identification can be a major challenge for facilities in the EHR environment. The issues are probably not new. Rather, HIM professionals are probably 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 staffs placed in the position of administering an appropriately grouped and cross-matched blood transfusion to an improperly identified patient.

The most common incongruities found in EMPI management are the duplicate and the overlay. 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 (it must be remembered that across some very large enterprises patients purposefully 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 purposefully indexed 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 number (e.g., ZEBRA, TR080 #01582444) are assigned to facilitate pre-hospital care when the patient cannot be accurately identified in the field. Similarly, facilities offering psychiatric emergency services or routine psychiatric services may purposefully duplicate an alias and medical record number on a patient so care can commence when patients may not be able to accurately identify themselves because of their psychiatric conditions (e.g. MARIGOLD, PES041 #01582678). Later, when the patient has stabilized, the patient can be identified accurately after research in the EMPI or other resources and the alias name and MR# merged to the correct number by EMPI staff. Importantly, 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 can eventually 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 the second. Merging to one of the numbers should only be undertaken after thorough analysis of both the electronic results and text documents available online and the paper-based documents and reports available only in non-electronic 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
<p>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 user to a later or earlier number. Physical paper records moved from one numbered cover to another. Preparation of appropriately named, identified, and bar-coded folders as necessary.</p>	<p>Unusual to see with respect to this function. Day-to-day same functioning as paper-based systems. Electronic records may have to be moved as well within electronic source and archival systems.</p>	<p>EMPI is major database component of all vended health information systems. Lookup functionality should include probabilistic algorithm to help admissions and registration staff to choose correct client. Identified duplicates merged with catalogue kept of all medical record numbers, aliases, or other identifiers stopped from the past with dates of stopping. 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, 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.</p>

Overlays may be an even greater challenge to the management of the EMPI. Often involving direct knowledge of one individual and his 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 identity and obtain healthcare services. A mental health patient may invent aliases on 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 of the two individuals apart if warranted.

Paper Systems	Hybrid or Transitional Systems	Fully Electronic Systems
<p>Since all visits are mixed together on one 3x5" card, after analysis, the resulting two cards will have to be rekeyed to include <i>only</i> those encounter dates and 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</p>	<p>Day-to-day, the same functioning as paper-based systems. Electronic records may have to be moved as well within electronic source and archival systems to end up with two patients, each on one medical record number.</p>	<p>Functioning must be present in system to allow two individuals to be pulled apart, encounter-by-encounter. All text documents, assessments, and diagnostic results associated with an encounter should move automatically with the encounter rather than having to be moved individually. When results or documents are viewed subsequently, 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 relocation of results and documents.</p>

appropriate names, identifiers, and barcodes.		
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Ongoing periodic identification of duplicates should be undertaken using probabilistic algorithms to identify sets of individuals likely to be the same person. This 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 worked by EMPI staff on a routine basis to clear the EMPI of duplicates. However, just because an individual is identified to *possibly* be the same as another on the duplicate patient report, this should not be taken at face value. The same examination of each individual candidate set with examination of existing physical records should be undertaken for this brand of identified possible duplicates as is undertaken for those 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 as total analysis of index cards for possible duplicates almost impossible on any periodic basis.	As EMPI moves to electronic format, probabilistic identification of sets for examination as possible duplicates should be undertaken. Careful examination of the physical record to ensure identity of the nominated sets is the same must be maintained.	Probabilistic identification of sets for examination as possible duplicates should be an expectation of every vended system in healthcare. Careful examination of the various electronic results, documents, assessments, and demographics of the nominated set must be undertaken prior to merging.

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