Chapter 2
Functions of the Health Record

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Learning Objectives

• To define the term *health record*
• To understand the various uses of the health record
• To identify the different users of the health record and its importance to each user
• To describe the functions of the health record
• To describe the components of health record data quality
• To understand the patient’s right to privacy and the requirements for maintaining the confidentiality of patient-identifiable health information
• To recognize the importance of information security
• To identify the roles and responsibilities of health information management professionals in the development and maintenance of health record systems

Key Terms

Accreditation organizations
Aggregate data
Allied health professionals
Centers for Medicare and Medicaid Services (CMS)
Coding specialist
Confidentiality
Data
Data accessibility
Data accuracy
Data comprehensiveness
Data consistency
Data currency
Data definition
Data granularity
Data precision
Data quality management
Data relevancy
Data timeliness
Diagnostic codes
Electronic health record (EHR)
Health record
Information
Integrated health record format
Privacy
Problem-oriented health record format
Procedural codes
Quality improvement organizations (QIOs)
Reimbursement
Source-oriented health record format
Third-party payers
Transcriptionists
Utilization management organization

Introduction

The health record is the principal repository (storage place) for data and information about the healthcare services provided to an individual patient. It documents the who, what, when, where, why, and how of patient care.

Healthcare providers have created and maintained records of the medical care provided to individual patients for centuries. However, modern documentation standards for the health record did not begin to appear until the early twentieth century.

Today, almost every person in the United States has at least one health record with his or her identification on it. Moreover, every time a person consults a new healthcare provider, another health record is created. Thus, it is very likely that any given patient may have multiple health records.
The health record is known by different names in different healthcare settings. The records of acute care patients who receive services as hospital inpatients are often called patient records. Physicians and physicians’ office personnel typically use the term medical record. The records of patients in long-term care facilities are often called resident records. Facilities that provide ambulatory behavioral health services sometimes refer to client records. Paper-based health records are also sometimes called charts, especially in hospital settings. No matter what term is used, however, the primary function of the health record is to document and support patient care services.

Although sometimes used interchangeably, the terms data and information do not mean the same thing. Data represent the basic facts about people, processes, measurements, conditions, and so on. They can be collected in the form of dates, numerical measurements and statistics, textual descriptions, checklists, images, and symbols. After data have been collected and analyzed, they are converted into a form that can be used for a specific purpose. This useful form is called information. In other words, data represent facts and information represents meaning.

Today, the management of health record systems and services is the primary responsibility of health information management (HIM) professionals. As discussed in chapter 1, the HIM profession has evolved as healthcare delivery has changed since individual patient records were first created almost a hundred years ago. The ongoing development of computerized healthcare applications and standards continues to bring change to the profession.

The traditional practice of health record management was based on the collection of data on paper forms stored in paper file folders. Paper-based documentation systems are gradually being replaced with electronic systems. Today’s HIM professionals are challenged with managing hybrid record environments that are partially electronic and partially paper based. Future professional practice will be based on the electronic collection, storage, and analysis of healthcare information created and maintained in interactive electronic health record (EHR) systems.

**Theory into Practice**

Until recently, most healthcare providers documented their services directly in the paper-based records of their patients. That is, they handwrote or dictated their clinical notes and orders and filled out paper data-collection forms. Dictated reports were typewritten by transcriptionists and then checked by clinicians for accuracy. All these paper-based materials were then filed in paper folders or clipped together in paper charts.

Today, information technology is revolutionizing the way healthcare data and information are created, collected, and stored. Virtually every healthcare organization uses computer technology to collect, store, or retrieve some portion of a patient’s healthcare data. For example, the results of laboratory tests have been routinely reported via computer printouts for some time. In many environments, healthcare providers can also access these results via computer workstations and other computerized output devices.

Movement toward EHRs has become part of the national agenda in the United States. Eventually, every healthcare organization will need to adopt a “paperless” health record system. In 2001, the National Committee on Vital and Health Statistics (NCVHS) issued a report and recommendations detailing how to build a national health information infrastructure (NCVHS 2001). Based on these recommendations and in an effort
to reduce healthcare costs, improve care, and avoid medical errors, President George W. Bush has outlined a plan to achieve EHRs for most Americans by 2014. The Office of the National Coordinator for Health Information Technology (ONC), a sub-Cabinet-level post at the Department of Health and Human Services (HHS), is coordinating this national effort.

While a national infrastructure for EHRs is being created, individual healthcare providers are learning how to use computers and digital devices that will soon replace paper-based health records. A significant challenge for healthcare organizations is the development of effective documentation procedures and screens (the electronic data collection formats that will replace paper forms) that save personnel time. In addition, EHR technologies and systems must be designed and implemented so as not to intrude on the human relationship between provider and patient. To make EHRs a reality, physicians, nurses, and other clinicians need to be comfortable with using devices such as personal data assistants (PDAs) and computer keyboards in place of paper and pen.

**Purposes of the Health Record**

Health records are used for a number of purposes related to patient care. The primary purposes of the health record are associated directly with the provision of patient care services. The secondary purposes of the health record are related to the environment in which healthcare services are provided. The secondary purposes are not related directly to specific patient care encounters (Dick, Steen, and Detmer 1997, 77–79).

**Primary Purposes**

According to the Institute of Medicine (Dick, Steen, and Detmer 1997, 77–78), the primary purposes of the health record can be classified into the following categories:

- **Patient care delivery**: The health record documents the services provided by clinical professionals and **allied health professionals** working in a variety of settings. Health record documentation helps physicians, nurses, and other clinical care professionals make informed decisions about diagnoses and treatments. The health record is also a tool for communication among the individual patient’s different caregivers. Effective communication ensures the continuity of patient services. Moreover, the detailed information stored in health records allows healthcare providers to assess and manage risk. Finally, the health record represents legal evidence of the services received by the individual patient.

- **Patient care management**: Patient care management refers to all the activities related to managing the healthcare services provided to patients. The health record assists providers in analyzing various illnesses, formulating practice guidelines, and evaluating the quality of care.

- **Patient care support processes**: Patient care support encompasses the activities related to the handling of the healthcare organization’s resources, the analysis of trends, and the communication of information among different clinical departments.
• *Financial and other administrative processes*: Because the health record documents the patient’s course of illness and treatment, the information in it determines the payment the provider will receive in every type of reimbursement system. Health record data elements are trended to assist in managing and reporting costs.

• *Patient self-management*: Individuals are becoming more actively involved in managing their own health and healthcare and are therefore becoming a primary user of the health record (IOM 2003, 5).

Figure 2.1 (p. 28) lists examples of the primary uses of the health record.

**Secondary Purposes**

The secondary purposes of the health record are not associated with specific encounters between patient and healthcare professional. Rather, they are related to the environment in which patient care is provided. According to the Institute of Medicine (IOM), education, research, regulation, and policy making are all considered secondary purposes of the health record (Dick, Steen, and Detmer 1997, 76–77). Figure 2.2 (p. 29) lists some examples of the secondary purposes of the health record. In 2003, public health and homeland security were added to the list of secondary purposes (IOM 2003, 5).

**Check Your Understanding 2.1**

*Instructions*: Indicate whether the following statements are true or false (T or F).

1. ____ The health record is the principal repository (storage place) for data and information about the healthcare services provided to individual patients.

2. ____ The lab test result “hemoglobin: 14.6 gm/110 ml” is considered information.

3. ____ All the primary purposes of the health record are associated directly with the provision of patient care services.

4. ____ Review of the health record by the physician to determine how to treat the patient is considered one of its primary purposes.

5. ____ The secondary purposes of the health record are related to the environment in which healthcare services are provided but are not related directly to specific patient care encounters.

6. ____ Submitting health record documentation to a third-party payer for the purpose of substantiating a patient bill is considered a secondary purpose of the health record.

7. ____ Use of the health record to study the effectiveness of a given drug is considered a primary use of the health record.

8. ____ Use of healthcare information by a state government agency to establish funding for smoking cessation programs is considered a secondary use of the health record.

9. ____ Use of health information by a respiratory therapy student to write a report as part of a requirement for a course he is taking is considered a primary use of the health record.

10. ____ The terms *data* and *information* mean the same thing.
Figure 2.1. Primary purposes of the health record

**Patient Care Delivery (Patient)**
- To document services received
- To constitute proof of identity
- To self-manage care
- To verify billing

**Patient Care Delivery (Provider)**
- To foster continuity of care (that is, to serve as a communication tool)
- To describe diseases and causes (that is, to support diagnostic work)
- To support decision making about diagnosis and treatment of patients
- To assess and manage risk for individual patients
- To facilitate care in accordance with clinical practice guidelines
- To document patient risk factors
- To assess and document patient expectations and patient satisfaction
- To generate care plans
- To determine preventive advice or health maintenance information
- To provide reminders to clinicians
- To support nursing care
- To document services provided

**Patient Care Management**
- To document case mix in institutions and practices
- To analyze severity of illness
- To formulate practice guidelines
- To manage risk
- To characterize the use of services
- To provide the basis for utilization review
- To perform quality assurance

**Patient Care Support**
- To allocate resources
- To analyze trends and develop forecasts
- To assess workload
- To communicate information among departments

**Financial and Other Administrative Processes**
- To document services for payments
- To bill for services
- To submit insurance claims
- To adjudicate insurance claims
- To determine disabilities (for example, workmen’s compensation)
- To manage costs
- To report costs
- To perform actuarial analysis

Source: Adapted from Dick, Steen, and Detmer 1997, 78, and IOM 2003, 5.
Users of the Health Record

The primary users of health records are patient care providers. However, many other individuals and organizations also use the information in health records. Managed care organizations, integrated healthcare delivery systems, regulatory and accreditation organizations, licensing bodies, educational organizations, third-party payers, and research facilities all use information that was originally collected to document patient care.

The IOM broadly defines the users of health records as “those individuals who enter, verify, correct, analyze, or obtain information from the record, either directly or indirectly through an intermediary” (Dick, Steen, and Detmer 1997, 75). All the users of health records influence clinical care in some way, but they use the information from health records for various reasons and in different ways. Some users (for example, nurses, physicians, and coding specialists) refer to the health records of specific patients as a part of their daily work. Many other users, however, never have direct access to the records of individual patients.
Instead, they use clinical and demographic information collected from the records. Figures 2.3 and 2.4 list examples of the individual and institutional users of health records (Dick, Steen, and Detmer 1997, 76–77).

**Individual Users**

As already noted, many individuals depend on the information in health records to perform their jobs. Some of these individual users are identified in the following paragraphs.

**Patient Care Providers**

The individuals who provide direct patient care services include physicians, nurses, nurse practitioners, allied health professionals, and other clinical personnel. Allied health professionals include physician assistants, physical therapists, respiratory therapists, occupational therapists, radiology technicians, and medical laboratory technicians. Other medical professionals also provide clinical services. These individuals include pharmacists, social workers, dietitians, psychologists, podiatrists, and chiropractors.

Direct patient care providers document their services directly in their patients’ health records. Other service providers (for example, medical laboratory technicians) submit separate written reports that become part of individual health records.

Healthcare providers offer services to a number of patients during any given period of time. For providers, the health record serves as a device for communicating vital information among departments and across disciplines and settings.

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**Figure 2.3. Representative individual users of health records**

<table>
<thead>
<tr>
<th>Patient Care Delivery (Providers)</th>
<th>Patient Care Management and Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Chaplains</td>
<td>• Administrators</td>
</tr>
<tr>
<td>• Dental hygienists</td>
<td>• Financial managers and accountants</td>
</tr>
<tr>
<td>• Dentists</td>
<td>• Quality managers</td>
</tr>
<tr>
<td>• Dietitians</td>
<td>• Records professionals</td>
</tr>
<tr>
<td>• Laboratory technologists</td>
<td>• Risk managers</td>
</tr>
<tr>
<td>• Nurses</td>
<td>• Unit clerks</td>
</tr>
<tr>
<td>• Occupational therapists</td>
<td>• Utilization review managers</td>
</tr>
<tr>
<td>• Optometrists</td>
<td></td>
</tr>
<tr>
<td>• Pharmacists</td>
<td></td>
</tr>
<tr>
<td>• Physical therapists</td>
<td><strong>Patient Care Reimbursement</strong></td>
</tr>
<tr>
<td>• Physicians</td>
<td>• Benefit managers</td>
</tr>
<tr>
<td>• Physician assistants</td>
<td>• Insurers (federal, state, and private)</td>
</tr>
<tr>
<td>• Podiatrists</td>
<td><strong>Other</strong></td>
</tr>
<tr>
<td>• Psychologists</td>
<td>• Accreditors</td>
</tr>
<tr>
<td>• Radiology technologists</td>
<td>• Government policy makers and legislators</td>
</tr>
<tr>
<td>• Respiratory therapists</td>
<td>• Lawyers</td>
</tr>
<tr>
<td>• Social workers</td>
<td>• Healthcare researchers and clinical investigators</td>
</tr>
<tr>
<td><strong>Patient Care Delivery (Consumers)</strong></td>
<td><strong>Health sciences journalists and editors</strong></td>
</tr>
<tr>
<td>• Patients</td>
<td></td>
</tr>
<tr>
<td>• Families</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Dick, Steen, and Detmer 1997, 76.
Figure 2.4. Representative institutional users of health records

**Healthcare Delivery (Inpatient and Outpatient)**
- Alliances, associations, networks, and systems of providers
- Ambulatory surgery centers
- Donor banks (blood, tissue, organs)
- Health maintenance organizations
- Home care agencies
- Hospices
- Hospitals (general and specialty)
- Nursing homes
- Preferred provider organizations
- Physician offices (large and small group practices, individual practitioners)
- Psychiatric facilities
- Public health departments
- Substance abuse programs

**Management and Review of Care**
- Medicare peer review organizations
- Quality management companies
- Risk management companies
- Utilization review and utilization management companies

**Reimbursement of Care**
- Business healthcare coalitions
- Employers
- Insurers (federal, state, and private)

**Research**
- Disease registries
- Health data organizations
- Healthcare technology developers and manufacturers (equipment and device firms, pharmaceutical firms, and computer hardware and software vendors for patient record systems)
- Research centers

**Education**
- Allied health professional schools and programs
- Schools of medicine
- Schools of nursing
- Schools of public health

**Accreditation**
- Accreditation organizations
- Institutional licensure agencies
- Professional licensure agencies

**Policy Making**
- Federal government agencies
- Local government agencies
- State government agencies

Source: Adapted from Dick, Steen, and Detmer 1997, 77.
Patient Care Managers and Support Staff
Patient care managers and support staff oversee the services provided to patients within their organization. The health record provides the data they need to evaluate the performance of individual patient care providers and to determine the effectiveness of the services provided. The patient care manager refers to the documentation in the health record when questions arise about a specific patient’s course of treatment or about the services the patient received.

Patient care managers also are responsible for the overall evaluation of services rendered for their particular area of responsibility. To identify patterns and trends, they take details from individual health records and then put all the information together in one place. On the basis of these combined aggregate data, the managers recommend changes to patient care processes, equipment, and services. The goal of the changes is to improve the future outcomes of patient care.

Coding and Billing Staff
Healthcare reimbursement is based on the documentation contained in the health record. By referring to the records of individual patients, coding specialists identify the patients’ diagnoses as well as the therapeutic procedures they underwent and the services they received. Using this information, coding specialists assign appropriate diagnostic and procedural codes. The coded information is then used to generate a patient bill and/or a claim for reimbursement to a third-party payer, such as a commercial health insurance company or government-sponsored health program such as Medicare.

Some third-party payers require billers to submit copies of portions of the health record along with the claims. The health record documentation substantiates the need for services and the fact that such services were provided.

Other Individual Users
Many other individuals may use the health record as a source of information.

Patients
Today, patients are taking an active interest in their own health and in the preventive and therapeutic healthcare they receive. Recent federal legislation—the Health Insurance Portability and Accountability Act (HIPAA) of 1996—includes health record security and privacy provisions. HIPAA grants most patients the right to see their health records. In addition, they have the right to correct the information in their records and to add missing information. They also can verify billed services.

Employers
Employers use information based on the health records of their employees to determine the extent and effects of occupational hazards. They also use health record information to manage healthcare and disability insurance benefits for their employees. Moreover, individual employees’ disability claims must be supported by the information in their health records.

Lawyers
The health record is considered legal documentation of the healthcare services provided to patients. Attorneys for healthcare organizations use it as a tool to protect the legal interests of the facility and its patient care providers. The legal representatives of physicians and their malpractice insurance carriers also depend on the documentation in the health record. Attorneys for patients who bring civil suits use health records to support claims for com-
pensation of medical malpractice. Attorneys also use information from the health record to determine the mental competency of individuals.

**Law Enforcement Officials**
Law enforcement officials, such as police officers, agents of the Federal Bureau of Investigation (FBI), sheriffs, and marshals, also may use the health record in limited situations. For example, health records are used in the investigation of gunshot injuries, child abuse and neglect, domestic violence, and other crimes. Law enforcement officials also use information contained in health records to identify and locate suspects, fugitives, material witnesses, and missing persons.

**Healthcare Researchers and Clinical Investigators**
Clinical research is the process by which the effectiveness of treatment methods is evaluated and improved methods for future care are developed. Researchers review health records for the particular population being studied and extract data. The data help them to evaluate and make decisions about disease processes and treatments. Healthcare researchers and clinical investigators also use aggregate health record data.

**Health Science Publishers and Journalists**
Healthcare consumers continue to seek more and more information about developments in clinical research, alternative medicine, preventive medicine, and public health. The Internet offers extensive healthcare information to Americans. Radio, television, and print journalists also look for legitimate sources of information on healthcare topics.

**Government Policy Makers**
Local, state, and federal government policy makers are responsible for evaluating the overall health and well-being of the populations they serve. Government agencies establish the requirements for reporting cases of certain communicable diseases. They also require the reporting of information relevant to health-related social issues such as gunshot wounds, teenage pregnancies, and drug abuse. The health record is the source for the information needed to meet such reporting requirements. Policy makers develop aggregate information, which serves as the basis for investigations of the health patterns and trends in a given population. Using this information, policy makers can develop and fund community programs.

**Institutional Users**
A number of organizations depend on access to healthcare-related information. The health record is the most reliable source of such information.

**Healthcare Delivery Organizations**
Healthcare delivery organizations include physicians’ practices, ambulatory clinics, blood and tissue donor banks, home care agencies, hospices, acute care hospitals, rehabilitation hospitals, psychiatric hospitals, long-term care facilities, and public health departments and clinics. Such organizations use data from health records in providing services, evaluating and monitoring the use of resources, seeking reimbursement for the services provided, and planning and marketing services.

**Third-Party Payers**
Third-party payers are organizations responsible for the reimbursement of healthcare services covered by some kind of insurance program. Third-party payers include commercial health insurance companies, managed care organizations, self-insured employers, and the
fiscal (or financial) intermediaries representing Medicare and Medicaid. Third-party payers review individual health records to determine whether the documentation supports the provider’s claim for reimbursement. Claims that are not supported by adequate health record documentation are often denied. Many third-party payers enter into contractual arrangements with medical review organizations to perform the actual review of health records.

**Medical Review Organizations**

Quality improvement organizations and utilization management organizations evaluate the adequacy and appropriateness of the care provided by healthcare organizations. Medical review organizations work under contract with the federal government. These organizations examine the individual health records for specific episodes of care to determine whether the services were medically necessary. Depending on the organization, this process may take place on a concurrent basis while the patient is still under treatment or on a retrospective basis after the patient has received services. The results of the medical reviews are usually linked directly to the level of reimbursement paid to the provider.

**Research Organizations**

Organizations performing healthcare-related research study the current healthcare environment to prove or disprove hypotheses related to disease processes and treatments. Research organizations include disease registries, research centers, and health data companies. In some instances, the law may require healthcare providers to provide aggregate data from health records on specific disease processes. In other instances, participation is voluntary. Healthcare providers committed to health education and research work closely with research organizations to develop and test experimental patient care protocols and to provide the relevant data from the health record.

**Educational Organizations**

Healthcare professionals undergo rigorous professional education based on classroom and hands-on training. Medical schools, dental schools, nursing schools, and allied health training programs frequently use health records as sources of case study information.

**Accreditation Organizations**

The mission of every accreditation organization is to improve the quality of services offered in healthcare facilities. Participation in accreditation programs is voluntary. Accreditation organizations include the Joint Commission on Accreditation of Healthcare Organizations, the American Osteopathic Association, the Commission on Accreditation of Rehabilitation Facilities, and the Accreditation Association for Ambulatory Health Care.

Every participating healthcare organization is subject to a periodic accreditation survey. Surveyors visit each facility and compare its programs, policies, and procedures to a pre-published set of performance standards. A key component of every accreditation survey is a review of the facility’s health records. Surveyors review the documentation of patient care services to determine whether the standards for care are being met. They then use the results of the review to make the overall accreditation decision. The surveys usually involve the direct review of a sample of health records from recent and current patients along with a review of aggregate statistics related to expected patient outcomes.

**Government Licensing Agencies**

The goal of local, state, and federal licensing agencies is to make sure that the healthcare facilities in their areas provide effective and appropriate care to healthcare consumers. Licensing agencies include state licensing bureaus and federal and state departments
responsible for certifying facilities that receive funding from the federal, state, and local
governments. As part of the licensing process, health records are reviewed to determine
whether the facility is complying with the licensing regulations in that geographic area.

Policy-Making Bodies
The **Centers for Medicare and Medicaid Services (CMS)** is a division of the U.S.
Department of Health and Human Services. (Until 2001, it was known as the Health Care
Financing Administration, or HCFA.) CMS is responsible for administering the federal
Medicare program and the federal portion of the Medicaid program.

Data taken from health records and supplied by healthcare organizations as part of the
Medicare billing and reimbursement process are kept in a national database. The database is
used to make decisions related to healthcare reimbursement mechanisms, the effectiveness
of healthcare services, and the general health of the Medicare population. Although the content
and sources of data differ, similar information databases are maintained at the state level.

In addition to the information kept in federal and state databases, policy-making bod-
ies rely on the support of various health-related organizations that have been created to
support high standards of healthcare in the United States. Although their overall mission
varies, organizations such as the American Medical Association, the American Psychi-
atric Association, the American Hospital Association, the American Health Information
Management Association, the American College of Surgeons, and the American College
of Physicians all develop healthcare standards. They also make recommendations to the
federal and state governments on healthcare policy issues.

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**Check Your Understanding 2.2**

*Instructions:* Indicate whether the following statements are true or false (T or F).

1. ____ A physical therapist documenting in the health record is an institutional health record
   user.

2. ____ A surveyor from the American College of Surgeons reviewing a health record to
determine compliance with the Commission on Cancer standards is an institutional
health record user.

3. ____ An HIM professional extracting data from a paper-based record for an analysis of
infection rates requested by hospital administration is an individual health record user.

4. ____ A patient requesting a copy of her health record is an individual health record user.

5. ____ An auditor employed by Medicare that is reviewing health records for a mortality
study is an individual health record user.

6. ____ A physician who has a contract with the state department of health to analyze the
factors associated with an influenza outbreak in the state is an institutional health record
user.

7. ____ Epidemiologists from the U.S. Department of Homeland Security studying the
incidence of life-threatening organisms are individual health record users.

8. ____ A physician reviewing a health record of his patient to determine a diagnosis is an
individual health record user.

9. ____ A police officer investigating a missing person report is an institutional health record user.

10. ____ An attorney defending a healthcare organization in a civil complaint from a patient is
an individual health record user.
Functions of the Health Record

The primary function of the health record is to store patient care documentation. A number of systems, policies, and processes make it possible to collect patient care documentation efficiently and to store it in easily accessible and secure formats of high quality.

Besides storage of patient care documentation, the health record has other equally important functions. These include helping physicians, nurses, and other caregivers make diagnoses and choose treatment options. Paper-based health record formats limit these types of clinical decision making functions. With the implementation of EHR systems, the function of the health record as an interactive tool for clinical problem solving and decision making will increase.

Storage of Information

As noted earlier, the main function of the health record is to store patient care data and information. According to the IOM (Dick, Steen, and Detmer 1997, 81–93), the attributes associated with the storage function are accessibility, quality, security, flexibility, connectivity, and efficiency.

Accessibility
Authorized users of the health record must be able to access information easily when and where they need it. Every health record system should allow record access 24 hours a day.

Any organization that maintains health records for individual patients must have systems in place that identify each patient and support efficient access to information on each patient. The systems must be able to do this regardless of the format in which the record is stored.

Quality
Clinicians, patients, administrators, researchers, and many other individuals and organizations rely on the quality of the information in the health record. In large part, the quality of such information depends on the design of the organization’s systems and processes for collecting the original information.

Health record information is collected in different ways and from numerous sources. Patients and their families provide information to healthcare providers. Healthcare providers retrieve information from the documentation of previous patient encounters. Physicians and other providers make direct observations about the patient, assess clinical problems, provide diagnostic and therapeutic services, and evaluate the results of therapy. The data generated by electronic diagnostic and monitoring equipment such as laboratory results and tracings from heart monitors are also included in the health record. All this information is recorded on paper forms or in computer formats to become part of the health record.

Data Quality Management
To accomplish the primary and secondary purposes of the health record, the data in it must be of the highest quality. Incomplete or missing data (for example, unrecorded lab results) could compromise patient care. Likewise, they may contribute to incorrect assumptions made by policy makers. Further, incomplete or missing data could result in inaccurate research findings. One of the HIM professional’s most important roles is to ensure that the health record contains the highest-quality data possible.
In 1998, the American Health Information Management Association (AHIMA) developed a **data quality management** model, which is based on four domains (Cassidy et al. 1998):

- **Data applications**: The purposes for which data are collected
- **Data collection**: The processes by which data are collected
- **Data warehousing**: The processes and systems by which data are archived (saved for future use)
- **Data analysis**: The processes by which data are translated into information that can be used for designated application

The data quality management model applies the following quality characteristics to the four quality management domains:

- Accuracy
- Accessibility
- Comprehensiveness
- Consistency
- Currency
- Definition
- Granularity
- Precision
- Relevancy
- Timeliness

**Data accuracy** means that data are correct. The data should represent what was intended or defined by the original source of the data. For example, the patient’s emergency contact information recorded in a paper record or a database should be the same as what the patient said it was. Results of laboratory testing for a particular patient should reflect the results generated by the laboratory equipment. Data related to the medication provided to a particular patient should reflect the actual date, time, and medication administered. The accuracy of the data placed in the health record depends on a number of factors, including:

- The patient’s physical health and emotional state at the time the data were collected
- The provider’s interviewing skills
- The provider’s recording skills
- The availability of the patient’s clinical history
- The dependability of the automated equipment
- The reliability of the electronic communications media

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Data accessibility means that the data are easily obtainable. The following factors affect the accessibility of health record data and information:

- Whether previous health records are available when and where they are needed
- Whether dictation equipment is accessible and working properly
- Whether transcription of dictation is accurate, timely, and readily available to healthcare providers
- Whether computer data-entry devices are working properly and are readily available to healthcare providers

Data comprehensiveness means that all the required data elements are included in the health record. In essence, comprehensiveness means that the record is complete. In both paper-based and computer-based systems, having a complete health record is critical to the organization’s ability to provide excellent patient care and to meet all regulatory, legal, and reimbursement requirements. In general, the health record must include the following data elements:

- Patient identification
- Consents for treatment
- Advance directives
- Problem list
- Diagnoses
- Clinical history
- Diagnostic test results
- Treatments and outcomes
- Conclusions and follow-up requirements

Data consistency means that the data are reliable. Reliable data do not change no matter how many times or in how many ways they are stored, processed, or displayed. Data values are consistent when the value of any given data element is the same across applications and systems. Related data items also should be reliable. For example, the clinical history for a male patient would never include a hysterectomy as a past surgical procedure.

Legitimate documentation inconsistencies do occur in health records. Any given health record may contain numerous references to the patient’s diagnosis in terms of:

- The admitting diagnosis
- The diagnostic impression upon physical examination
- The postoperative diagnosis
- The pathology diagnosis
- The discharge diagnosis
Any inconsistencies among the various types of diagnoses would be legitimate. The different diagnoses incorporate the results of tests and findings not available at the time the previous documentation took place.

In other instances, however, data inconsistencies in the health record are not acceptable. For example, a nursing assessment might indicate that the patient is deaf when there is no documentation by the physician that the patient’s hearing is compromised. Another unacceptable inconsistency occurs when different healthcare providers use different terminology. For example, different providers might use the words *cyst, lesion,* and *abscess* interchangeably in documenting a skin condition for the same patient. Such inconsistencies create difficulties for other caregivers and can be very confusing to external users of the health record.

**Data currency and data timeliness** mean that healthcare data should be up-to-date and recorded at or near the time of the event or observation. Because care and treatment rely on accurate and current data, an essential characteristic of data quality is the timeliness of the documentation or data entry.

**Data definition** means that the data and information documented in the health record are defined. For information to be meaningful, it must be pertinent. Users of the data must understand what the data mean and represent. Every data element should have a clear definition and a range of acceptable values.

**Data granularity** requires that the attributes and values of data be defined at the correct level of detail. For example, numerical values for laboratory results should be recorded to the appropriate decimal place as required for the meaningful interpretation of test results.

**Data precision** is the term used to describe expected data values. As part of data definition, the acceptable values or value ranges for each data element must be defined. For example, a precise data definition related to gender would include three values: male, female, and unknown. Precise data definition yields accurate data collection. In paper-based health records, much of the documentation and data is collected in narrative format and it is difficult to apply the concept of data precision to narrative text. The movement toward computerized patient records provides the perfect opportunity to improve data precision in health records.

**Data relevancy** means that the data in the health record are useful. The reason for collecting the data element must be clear to ensure the relevancy of the data collected. In paper-based health records, the volume of detail provided often limits the usefulness of the data and information (Abdelhak 2001). For example, nursing documentation is often lengthy and physicians and other caregivers may not have sufficient time to review it.

**Security**
Healthcare organizations and the clinical professionals who provide patient care services depend on the accuracy and accessibility of the information collected and stored in the health record. In addition, healthcare administrators, third-party payers, government agencies, accreditation organizations, and medical researchers all must have access to detailed healthcare information in order to fulfill their functions. However, these legitimate needs for access to information must be balanced against the public’s expectation that healthcare providers will respect and protect the **privacy** of their patients.

Privacy, **confidentiality**, and security are related, but distinct, concepts. In the context of healthcare, *privacy* can be defined as the right of individuals to control access to their personal health information. **Confidentiality** refers to the expectation that the personal
information shared by an individual with a healthcare provider during the course of care will be used only for its intended purpose. Security is the protection of the privacy of individuals and the confidentiality of health records. In other words, security allows only authorized users to access health records. In the broader sense, security also includes the protection of healthcare information from damage, loss, and unauthorized alteration. (Privacy, confidentiality, and security are discussed in more detail in chapters 14, 15, and 19.)

**Requirements for Access, Flexibility, Connectivity, and Efficiency**

For the health record to fulfill its intended purposes, several conditions must be met. Essentially, these involve how the health record is made available to legitimate users and how it is stored and maintained.

**Access**
To be useful, the health record must be made available to legitimate users. As mentioned earlier, protecting the confidential nature of the health record is extremely important and is one of the HIM professional’s primary responsibilities.

In paper-based health record systems, access control is relatively straightforward. The records are stored in locked storage areas that are accessible only to authorized HIM staff. When needed for patient care purposes, the health record is retrieved from the file and forwarded to the appropriate service area. The record is then logged out according to a prescribed procedure. In this way, the HIM staff knows where to find the record in the event it is needed by another department or provider.

EHR systems have the same access control requirements that paper-based systems do. However, the mechanisms for controlling access to confidential information are different. Access control mechanisms are built in to EHRs. Technology-based access control mechanisms include the use of passwords, access cards or tokens, biometric devices, workstation restrictions, and role-based restrictions. (See chapter 19 for additional information on access control.)

**Flexibility**
Health record data should be flexible enough to meet the needs of all the record’s different users. In paper-based health record systems, this characteristic cannot be fully realized. Standardized forms are designed to make data readily available and meaningful to those caring for the patient. However, these forms may not support the needs of everyone who uses the health record. For example, individual physicians may wish to view laboratory results in ways that a single standard display does not permit.

When designed appropriately, EHR systems can be extremely flexible in the way they display and present information. Authorized caregivers and other legitimate health record users display the information they need in the formats they prefer. For example, caregivers may wish to see views of the data by source, encounter, problem, date, or any number of other variables. Further, they may need data in detail or in summary form. Some users may only need to know the presence or absence of certain data, not necessarily the nature of the data. In these instances, the EHR has the potential to accommodate these needs and enhance the confidentiality of patient-identifiable health information.

**Connectivity**

*Connectivity* refers to the capacity of health record systems to provide communication linkages and allow the exchange of health record data among information systems. Communications technology can be used within individual organizations to connect the vari-
ous information systems that contain electronic components of the health record. Health record information that is not stored in an electronic format, however, must be transferred from place to place within the organization in a paper-based format. The complete implementation of EHR systems will make full use of the technologies available.

**Efficiency**

Efficiency is another component of health record storage that will be improved in computer-based systems. As noted earlier, providing access to paper-based health records is an inefficient process, especially when information must be transferred between providers and facilities. Even internal transfers of health records can be troublesome because paper records may be needed in more than one place at a time. Moreover, paper records can be easily misplaced by users or misfiled by staff.

Another factor related to efficiency is the structure of the data. Today, much of the data entered into a computer-based system for storage has been scanned in from paper forms. Thus, most of the data are unstructured and cannot be used to make meaningful comparisons. For example, transcribed reports and data obtained from document imaging systems provide electronically stored text, but the information cannot be analyzed efficiently. In fully functional EHR systems, structured data capture processes will use controlled vocabularies and code sets. Data collected in standard forms can be analyzed efficiently and compared through computer software applications.

**Guidance in Clinical Problem Solving**

Physicians, nurses, and other caregivers use the information in individual health records as the basis for making diagnoses and choosing treatment options. A properly formatted health record can guide clinicians through the process of solving clinical problems. *Health record format* refers to the organization of electronic information or paper forms within the individual record.

Three types of formats are commonly used in paper-based record systems: source-oriented, problem-oriented, and integrated. The **source-oriented health record format** organizes the information according to the patient care department that provided the care. This format is used by most acute care hospitals. The **problem-oriented health record format** is a documentation approach in which the physician defines each clinical problem individually. Information about the problems is organized into four components: the database, the problem list, initial plans, and progress notes. The **integrated health record format** organizes all the paper forms in strict chronological order and mixes the forms created by different departments. (Chapter 3 discusses health record formats in more detail.)

Over the years, there has been a lot of debate about which record format is most useful for clinical problem solving. In 1991, the IOM’s Committee on Improving the Patient Record studied various formats. The committee could not agree on which format would be the most useful in improving patient care. It felt that a mere translation of current record formats from paper media to computer media would not result in meaningful improvements.

The report of the study (Dick, Steen, and Detmer 1997) noted that current record systems are based on clinician behaviors and record forms that produce substantial waste, imprecision, and complexity. It concluded that the movement toward EHR systems will give healthcare organizations and providers the opportunity to study and improve clinical approaches. Improvements in clinical care then will be reflected in the health record format (Dick, Steen, and Detmer 1997).
Today, developing EHR systems are introducing new formats and functionality. Results management, order entry, and order management were added to the EHR functional model by the IOM in 2003 (IOM 2003, 7–8).

**Results Management**

Having ready access to all types of results, including laboratory results, radiology results, and other test results, over a period of time helps providers make informed choices for diagnoses and treatment and increases quality of care. With EHRs, both current and previous computerized results can be displayed automatically for care providers to improve effectiveness and efficiency of treatment while reducing the cost of care by eliminating duplicate testing. EHR formats for trending and comparing results over time are not available in paper-based systems.

**Order-Entry/Order Management**

Computerized physician/provider order-entry (CPOE) systems have been developed to improve quality of care (Amatayakul 2004, 10). Whereas paper-based health records capture handwritten orders, CPOE provides physicians and other providers the ability to place orders via the computer from any number of locations and adds decision support capability to enhance patient safety. Early adopters of this technology have been able to eliminate lost orders, eliminate issues with illegible handwriting, eliminate duplicate orders, reduce medication errors, and reduce the time to fill orders (IOM 2003, 8). CPOE presents another new format and provides a health record functionality that is unique to the EHR.

As the EHR evolves, new formats will continue to be developed. Some will be more effective than others in encouraging the use of efficient, scientific problem-solving methods in the clinical process.

**Clinical Decision Support**

Effective and efficient patient care requires a great deal of complex information. To be an effective tool in clinical decision support, the health record needs to be more than a simple repository of patient care data (Dick, Steen, and Detmer 1997). Fully functional EHR systems will provide a number of decision-making tools that are not currently available in health record systems.

Clinical decision support tools can review structured electronic data and alert practitioners to out-of-range laboratory values or dangerous trends before problems become evident. The tools can recall relevant diagnostic criteria and treatment options on the basis of the data in the record. This will support the physician as he or she considers various diagnostic and treatment alternatives. Because the human memory is imperfect, such tools can provide a consistent supplementary knowledge base grounded in the latest clinical research.

In addition, computer-based clinical decision support tools can give clinicians instant access to pharmaceutical formularies, referral databases, and reference literature. This type of ready access provides clinicians with updates to information that they may use infrequently. Further, these applications can help healthcare professionals learn about new developments because the bibliographic information in the decision support databases is always up-to-date.

Standard commercial software packages also can be included in health information systems so that descriptive, graphical, and statistical analyses of clinical data can be car-
ried out. Such analyses may be limited to a specific case or performed on aggregate data to identify trends in a larger patient population. This functionality cannot be readily accomplished in paper-based record systems without a significant investment in staff time.

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**Check Your Understanding 2.3**

*Instructions:* Match the following terms with the correct definitions.

1. ___ Electronic health record  
2. ___ Confidentiality  
3. ___ Data consistency  
4. ___ Data comprehensiveness  
5. ___ Data granularity  
6. ___ Health record  
7. ___ Privacy  
8. ___ Security

a. A characteristic of data that is reliable  
b. A characteristic of data whose values are defined at the appropriate level of detail  
c. Documentation of the services provided to patients by clinicians  
d. An interactive health record that has functions beyond storage  
e. A program designed to protect patient privacy and to prevent unauthorized access, alteration, or destruction of health records  
f. A comparison of actual system activity with expected activity  
g. An individual’s right to control access to his or her personal information  
h. The expectation that the personal information shared by an individual with a healthcare provider during the course of care will be used only for its intended purpose  
i. A characteristic of data that includes every required data element

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**Real-World Case #1**

The following case study is adapted from a publication by Susan Helbig in the October 2004 IFHRO Congress and AHIMA Convention Proceedings.

The Department of Veterans Affairs (VA) has been implementing components of the electronic health record since the late 1990s. The system is designed to provide for reuse of the information previously documented on a given patient with copy/paste functionality. However, HIM professionals in many VA facilities began to experience health record integrity concerns as a result of this functionality. Busy clinicians were using the copy/paste function to take information from one document in the health record to another document to speed up the documentation process. According to Helbig, discharge summaries and progress notes were becoming extremely long because of all the copying of information from other portions of the record and because the information copied did not always reference the initial author. Coders were having difficulty determining what was actually done during a particular encounter as a result of the copy/paste practice.
In 2002, a study was initiated at VA Puget Sound Health Care System in Washington State to quantify the extent and effect of the concern. The health records of 243 patients with 29,386 notes and 6,322 copy events were reviewed as part of the study. The study found a relatively low rate of high-risk copying, but at least one high-risk event for every 10 patients reviewed.

**Real-World Case #2**

The following case study is adapted from a published proceeding by Liu Aimin for the October 2004 IFHRO Congress and AHIMA Convention.

In November 2002, the first case of SARS (severe acute respiratory syndrome) was found in China. By June 2003, there were more than 5,000 diagnosed cases and more than 300 deaths due to SARS in China alone. SARS was not officially announced as an infectious disease by the Chinese Disease Control. Therefore, multiple entities, including the government, health authority, and health bureau, were all trying to gather information on SARS in different formats and on different forms. According to Aimin (2004, 2), “In Spring 2003, SARS was out of control due to incorrect information.”

When the HIM departments of facilities received SARS paper-based health records, the records had to be pasteurized to prevent spread of the SARS infection. Department staff were unable to complete discharge record processing until pasteurization was complete.

To study SARS and develop an information system, the Chinese Health Ministry commissioned a SARS research project to collect SARS records from severely affected areas, compare forms, and abstract key data elements. This project is being conducted by the Chinese Medical Record Association, which is affiliated with the Chinese Hospital Association.

**Summary**

The health record is the principal repository of data and information about the healthcare services provided to patients. A number of individuals and institutions use it as a source of information, but the primary users are the clinical professionals who provide direct patient care. Secondary users include healthcare managers and administrators, government agencies and policy makers, third-party payers, researchers, educators, and accreditation organizations.

The primary function of the health record is the storage of patient care information. The most important attributes of record storage include accessibility, quality, security, flexibility, connectivity, and efficiency. The full implementation of interactive electronic health record systems will add more functionality to the health record that traditional paper-based records cannot provide. In addition to storing health information, EHRs will provide knowledge resources to help clinicians solve diagnostic problems, support clinical decision making and administrative processes, and provide support for electronic reporting for population health management.

The concepts of privacy, confidentiality, and security are central to health information management. Patients have the right to expect that healthcare providers will respect their privacy and guard their healthcare information against unauthorized access. Confidentiality forms the basis of meaningful patient–provider relationships. Without the protection
of confidentiality, patients would be reluctant to be honest and open about issues related to their health. Security ensures that the information stored in a health record is protected from unauthorized alteration, damage, and loss.

References


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