2.1 Describe the role of six healthcare professionals who maintain or use practice management and electronic health record applications.
2.2 Explain the difference between data and information.
2.3 Identify computer-based health information media.
2.4 Relate how screen-based data collection tools are used in healthcare.
2.5 Demonstrate how individual data elements are collected.
2.6 Describe electronic health record applications.
2.7 Identify laws, regulations, and standards that govern electronic health information.
2.8 Distinguish between practice management software and hospital health information software.

Key Terms

- American Recovery and Reinvestment Act of 2009 (ARRA)
- Clinical decision support
- Certification Commission for Health Information Technology (CCHIT)
- Clearinghouse
- Data
- Decision support
- Electronic health record (EHR)
- Electronic medical record (EMR)
- Federal Register
- Healthcare administrator
- Healthcare manager
- Health Information Exchange (HIE)
- Health systems administrator
- Health Insurance Portability and Accountability Act (HIPAA)
- Health Information Technology for Economic and Clinical Health (HITECH) Act
- Information
- Institute of Medicine (IOM)
- Master Patient (Person) Index
- Meaningful use (MU)
- Medical assistant (MA)
- National Health Information Network (NHIN)
- National Provider Identifier (NPI)
- Office administrator (manager)
- Office of the National Coordinator for Health Information Technology (ONC)
- Patient list
- Personal health record (PHR)
- Protected Health Information (PHI)
- Regional Extension Center (REC)
- Regional Health Information Organization
- Registered Health Information Administrator (RHIA)
- Registered Health Information Technician (RHIT)
- Voice Recognition

At the end of this chapter, the student should be able to:
What You Need to Know and Why You Need to Know It

As a healthcare professional you will be one of many who will be selecting, maintaining, and using electronic health record and management software. Knowing who within the organization is using the software and how they are using it is important to selecting a system that meets the needs of the organization. The collection of data must be done efficiently while meeting the documentation requirements of licensing and accrediting agencies, as well as insurance carriers (including Medicare), and conforming to the legal definition of an electronic health record. We will begin this chapter by reviewing the professionals involved and the positions they may hold within the organization. Then, the concepts of data structure, collection, and standards will be introduced in preparation for a more detailed level of instruction found in the remaining chapters of the text. We will also cover how data is collected, the tools used to collect the data, how data is transformed into information, and the regulations and standards that dictate the collection, maintenance, use, and storage of health information in an electronic form.

Health Information Management spans a wide range of functions and processes within a healthcare organization. Just about every decision that is made is based on statistics that are largely collected from the health records of a facility. The data that is captured will result in information that is used by care providers to make decisions regarding patient care and to justify reimbursement. In addition, various levels of administrators will use information in risk management activities, budgeting, strategic planning, quality assessment, and financial reporting. Report writing will be discussed in greater detail in Chapter 9.

Table 2.1 depicts a few of the medical professions within healthcare, the education or certifications they may hold, and the responsibilities they may have as pertains to the collection and use of information. This is not an exhaustive list, as there are myriad other positions such as therapists, laboratory technicians, and radiology technicians, just to name a few. Those listed are the positions held by individuals who will most likely be involved in selecting, implementing, maintaining, and using the electronic systems in a healthcare facility.

During the selection process, it is imperative that people with knowledge of health information standards, structure, and content be involved. The health information professional fulfills this role, particularly in hospitals. In addition, administrative staff who are responsible for the effective operation of the entire organization, including facility- or enterprise-wide information systems, are key to the process as well. That is not to say that individual department managers (laboratory, nursing, radiology, etc.) do not have a say—but the administrator(s) responsible for those departments may be the key players in the early stages of system selection.
<table>
<thead>
<tr>
<th>Profession</th>
<th>Certifications</th>
<th>Description</th>
</tr>
</thead>
</table>
| Health Information and Informatics | • Registered Health Information Administrator (RHIA)  
• Registered Health Information Technician (RHIT)  
• Certified Health Data Analyst (CHDA)  
• Certified in Healthcare Privacy and Security (CHPS) | • Work in any healthcare setting, but most often in acute care or specialty hospitals  
• Work in healthcare-related professions such as consultants, software trainers and installers, government agencies, insurance companies, and law offices  
• Associate's, bachelor's and master's degrees available  
• Many healthcare facilities, particularly hospitals, require certification  
Positions held in the following areas:  
• Health Information Department managers  
• Information Technology and Systems  
• Project management  
• Software analyst  
• Implementation support  
• Information system design  
• EHR implementation and management  
• Data analyst  
• Documentation management  
• Privacy/security  
• Release of healthcare information  
• Risk management  
• Compliance  
• Utilization management  
• Quality Assessment/Assurance  
• Cancer Registrar  
• Medical staff coordinator |
| Health Information Specialty Areas | Require completion of non-degree educational programs that prepare students to sit for competency exams in:  
• Clinician/Practitioner Consultant  
• Implementation Manager  
• Implementation Support Specialist  
• Practice Workflow & Information Management Redesign Specialist  
• Technical/Software Support Staff  
• Trainer | • The most recent health information/informatics roles  
• May work in any healthcare facility, inpatient or outpatient  
• Each competency exam is specific to a particular role that plays a part in meaningful use of the electronic health record (EHR) |
| Coding professionals               | • Certified Coding Associate (CCA)  
• Certified Coding Specialist (CCS)  
• Certified Coding Specialist-Physician (CCS-P)  
• Certified Professional Coder (CPC)  
• Certified Professional Coder-Hospital (CPC-H)  
• Certified Interventional Radiology Cardiovascular Coder (CIRCC®) | • Work in all healthcare settings  
• Work in healthcare-related settings such as consulting firms, software vendors, insurance companies  
• Certificate or associate's degree  
Positions held in the following areas:  
• Medical Coder  
• Reimbursement specialist  
• Insurance biller  
• Chargemaster specialist  
• Insurance claims specialist |
### Medical Assistants
- Certified Medical Assistant (CMA)
- Registered Medical Assistant (RMA)
- Typically employed in physicians’ office or other outpatient setting
- Requires associate’s degree or certificate
- Perform clinical duties such as prepping patients, taking vital signs, taking medical histories, assisting physician during exams, explaining minor procedures and giving instructions based on physician’s orders, and collecting specimens
- Perform administrative duties such as answering phone, making appointments, registering patients, maintaining health records, handing correspondence, filing health insurance claims, scheduling outpatient services, arranging referrals, and managing the office in general
- May hold positions as office managers or business managers within a medical practice

### Healthcare Administrators
- Certified Health Care Facility Manager (CHFM)
- Fellow of the American College of Healthcare Executives (FACHE)
- American College of Medical Practice Executives (ACMPE) Certification
- Work in all healthcare organizations
- Bachelor’s or master’s degree typically required
- Plan, organize, coordinate, and direct facility or department operations
- Positions held with the following titles:
  - Hospital administrator
  - Chief Information Officer/Manager
  - Project manager
  - Department manager
  - Office manager
  - Office administrator

### Care Providers
- Physicians (Doctor of Medicine [MD]), Doctor of Osteopathy (DO)
- Physicians’ Assistants (PA, PA-C)
- Certified Nurse Practitioners (CNP)
- Certified Registered Nurse Midwives (CRNM)
- Work in any healthcare setting
- Requires advanced education, licensure, and possibly certification
- The only medical professionals who can diagnose a patient, order diagnostic testing and therapeutic (including medications) measures

### Nursing
- Registered Nurse (RN)
- Licensed Practical Nurse (LPN)
- Provide direct care to patients
- May also hold non-direct care positions in Utilization Management, Risk Management, Quality Assessment, and general management positions within a healthcare facility
- Nursing Informatics
- Requires associate’s or bachelor’s degree at a minimum; management positions and informatics positions may require a master’s degree

## 2.1 The Professionals Who Maintain and Use Health Information

In the inpatient setting, the **healthcare administrator** may be a chief executive officer (CEO), chief operating officer (COO), chief financial officer (CFO), or chief information officer (CIO). These individuals typically have a bachelor’s or master’s degree (preferred) in healthcare
administration and are responsible for overseeing several departments (or the entire organization). Their degree is most likely in healthcare administration, healthcare management, or health systems administration. These individuals, who may also be called a healthcare manager or health systems administrator, concentrate on the big picture—the operation of the organization as a whole, and in regard to health information they are concerned with how an automated systems affects individual departments—will it meet the needs of the board of directors and administration to supply adequate, easily obtainable decision support data—will the clinicians have easily accessible, fast information—is the system secure and does it meet all standards and regulations? The health systems administrator may be known as the chief information officer and will typically have a great deal of knowledge and experience related to the technical aspects of automated systems.

In a hospital setting, the Director of the Health Information Department and the Chief Information Officer work closely. Each plays a key role in the selection of the product. Health Information Professionals have basic clinical knowledge, technical knowledge of automated systems, and expertise in record-keeping practice, putting them in a position to lead automation of health information efforts. Depending on the level and content of his or her education, a health information management professional may hold the position of chief information officer. Traditionally, the data itself has been the health information manager’s main concern, and the use of the actual technology has been scope of the chief information officer’s domain. The staff of the health information department will need to enter, maintain, and retrieve data from electronic health records and may be certified by the American Health Information Management Association (AHIMA). Various certifications are listed in Table 2.1, as well as other certifications for health information professional. The most recent development in health information careers and competencies is the recognition of competency exams in specialty areas which are also explained in Table 2.1.

In a medical office or other outpatient setting, healthcare administrators may have the same titles as are used in the inpatient setting, or they may be called Office Manager, Office Administrator, Business Manager, and the like. These individuals are keenly aware that electronic systems can greatly enhance the efficiency of an office, or can just as easily be a negative force that causes inefficiencies; therefore, they are at the forefront of selecting and maintaining electronic systems that meet the needs of the practice and its practitioners. Certification of professionals in the outpatient setting is just as important as in the inpatient setting.

Healthcare professionals such as medical assistants, nurses, medical coders and billers, and other administrative professionals will be using the software in a medical practice and will want it to be “user friendly,” since they will be required to enter and retrieve data quickly yet accurately. The office administrator (manager) will be gathering information from the practice management and EHR systems to ensure claims are filed and paid accurately and in a timely manner, to ensure requirements of managed care organizations are met, and to ensure compliance with meaningful use (MU) requirements. Meaningful use will be discussed throughout this worktext.
The American Health Information Management Association (AHIMA), the American Association of Medical Assistants (AAMA), and the American Medical Technologists (AMT) are professional associations that offer certifying exams, and provide members with up-to-date, relevant information about their respective fields, continuing education opportunities, networking opportunities, publications, and career assistance. The websites for each are www.ahima.org, www.aama-ntl.org, and www.americanmedtech.org, respectively.

2.2 Data versus Information

Throughout this worktext you will see the terms data and information. They are often used interchangeably, but they are not entirely the same. Look up each term in a dictionary, and you will see within the definitions that the terms are almost interchangeable or synonymous. Think of it this way, though—data is a single fact, such as the patient is 60 years old, or that the patient is female, or the patient is African American. Single facts come together to form information. For example, the fact that Elena Jones is allergic to penicillin is a piece of data. But, add to that piece of data the fact that she breaks out in hives, has difficulty breathing, and required an emergency room visit for her last allergic reaction and we have information about Elena and her allergy to penicillin. It is vitally important that each piece of data is accurate, valid, and timely to ensure that the information resulting from the data is also accurate, valid, timely, and in a usable format to ensure quality medical care.

Data may be unstructured or structured. Examples of unstructured data are a dictated report, a written progress note, voice files, or scanned images of original documents. In this unstructured format, it is difficult, if not impossible, to track or trend statistics, or to share information with healthcare agencies, public health agencies, or insurance carriers. Structured data—such as standard templates that are used to collect the elements of the dictated report or progress note, bar codes to identify types of reports or individual files, or numeric codes that equate to a written diagnosis or procedure—allow computers to process the data into usable information.

Check Your Understanding

1. Define data.
2. _____ makes up _____.
Prior to there being an electronic health record system, clinicians relied on one medium to collect and access information about patients—paper. Many pieces of paper make up the health record, and records of patients are often several inches thick. Paper records are contained in a folder that is filed numerically by a medical record number or alphabetically by the patient's last name. It is not that paper is no longer in use, but electronic media is gaining acceptance in the healthcare community. And in the coming years, the electronic health record will be a requirement rather than a choice thanks to the Health Information Technology for Economic and Clinical Health Act (HITECH), which will be addressed later in this chapter. Many health insurance plans are making electronic personal health records (PHR) available to their subscribers. A PHR contains a person’s health history, immunization status, current and past medications, allergies, and instructions given by a care provider; it often includes patient education materials as well. Though insurance carriers may provide the means to keep a PHR online, this does not replace the legal health record kept by the patient’s care provider.

Electronic health records provide physicians with decision support software, which is used to access current information about a disease or condition. This technology alerts the care provider to possible medication interactions, gives treatment options based on results of clinical trials or research, and alerts the provider that a patient may have a particular diagnosis based on the data found in his or her electronic record. Not so long ago, physicians were opposed to this technology, thinking it was “cookbook medicine”; this is no longer the case, since great advances in the diagnosis and treatment of illnesses occur so quickly, making it very difficult or impossible to keep up with the most recent studies, findings, and recommended treatments. Thus, decision support applications within an EHR software package help to keep physicians up to date as well as improve the quality of care given to patients.

Physicians can use computerized models within the EHR to show where a patient’s rash is located, for example, rather than placing an “X” on a crudely drawn picture of a patient’s back (Figures 2.1 and 2.2).

The use of videos or DVDs is not new technology, although they are now used more often to educate patients about the procedure they are about to undergo than are handouts or educational booklets. The care provider may choose to show patients a video while they are in the office, or provide a link to a video for patients to view from their home computer. Using this type of media ensures that the information used to educate patients is consistent.

Most EHRs now provide educational materials for patients, and the educational materials can be specific to a particular patient’s conditions, including treatment options, medications, etc. The educational materials may be printed out for the patient, or they
Physicians and administrators may want to visually present findings of a study or to consult with another physician and show a patient’s disease progression. This can be done through use of software that has been available for years—presentation software such as Microsoft Power-Point® or Open Office IMPRESS. Spreadsheets are often useful in making a point as well. EHR software provides the ability to visually chart changes in a patient’s vital signs, for example, and show trends or statistical changes. Patient care and treatment is greatly enhanced with the ability to track vital signs over time, thus alerting the care provider to changes in a patient’s condition.

Let us look at a particular scenario. Patti Wolfe has been seeing Dr. Raszkowski for the past five years. She has been faithful about having a yearly physical exam. For the past four years, her blood pressure has increased on each visit. In 2008, her blood pressure was 130/80; in 2009, it was 135/82; in 2010, it was 130/83; and in 2011, it was 140/88. Seeing this steady climb, Dr. Raszkowski explained the situation to Mrs. Wolfe, and began her on a treatment regimen. Without this quick visual of her blood pressures, the subtle changes may not have been picked up by the physician, and her high blood pressure could have gone untreated.

**Voice recognition** technology is a medium that has been available for many years and has steadily gained in popularity. This software translates what a provider is saying and types those words into text. Whereas physicians used to dictate into a microphone and a medical transcriptionist would type the words, using word processing software, with voice recognition software the physician still dictates, but the software captures his or her words, then converts speech into text. With speech recognition, the medical transcriptionist’s role has changed from transcriber to editor. The software is not 100 percent accurate, however, and in the world of medicine, it needs to be. Thus, a human being must still review the final document for accuracy.
Picture Archiving and Communication Systems (PACS) allow providers to view images such as x-rays, scans, ultrasounds, and the like. Originally used as a means to store x-ray film, PACS systems make it possible for providers to remotely view x-ray film to aid in clinical decision support. The improved image quality using PACS systems as well as the ability to add alerts or reminders based on the findings noted in PACS greatly improves patient care. Figure 2.3 illustrates a typical PACS system used to view radiologic images.

Check Your Understanding

1. In the past, physicians marked the location of a patient’s pain by drawing an “X” on a picture of a body. With the advantage of EHRs, what are they now able to do?

2. What does PACS stand for?

3. What do PACS allow providers to do?

2.4 Screen-Based Data Collection Tools

Those who are entering (also known as capturing) data typically do so on a computer screen. It may be done on a desktop computer, a laptop, a notebook computer, or a personal digital assistant (PDA). Each of these pieces of hardware will be discussed in Chapter 10, but the commonality between them is that data can be entered and then retrieved by using a computer screen. Think of the screen as the replacement for paper. Advantages include the portability of the hand-held devices, the ability to have multiple monitors showing different images at the same time, and the ability to customize a screen based on user preference. With paper records, there is typically an order in which the individual papers are filed within the folder, but not all care providers prefer that same order. Take a look at the two screens showing a patient’s history in Figures 2.4 and 2.5—you see that the same information is collected but that the information is in different places on the screen.
So, we have this data, but how did we get it in the first place? It all starts when the patient makes an appointment with a physician’s office or comes to the hospital for an emergency department visit, outpatient laboratory, outpatient surgery, or inpatient admission.
We collect identifying information verbally from the patient (or representative), or we ask the patient to complete a form (or a combination of both). See Figure 2.6 for an example of a registration form.

**Greensburg Medical Center**

**REGISTRATION FORM**

(Please Print)

<table>
<thead>
<tr>
<th>Today's date:</th>
<th>Care Provider:</th>
</tr>
</thead>
</table>

### PATIENT INFORMATION

<table>
<thead>
<tr>
<th>Patient's last name:</th>
<th>First:</th>
<th>Middle:</th>
<th>Mr.</th>
<th>Mrs.</th>
<th>Miss</th>
<th>Ms.</th>
<th>Marital status (circle one)</th>
<th>Single / Mar / Div / Sep / Wid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Is this your legal name?**

- [ ] Yes
- [ ] No

**If not, what is your legal name?**

**Former name:**

**Birth date:**

**Age:**

- [ ] M
- [ ] F

**Street address:**

**Social Security no.:**

**Home phone no.:**

**P. O. Box:**

**City:**

**State:**

**ZIP Code:**

**Occupation:**

**Employer:**

**Employer phone no.:**

**E-mail address:**

**Cell phone:**

**Race:**

**Ethnicity:**

**Primary language:**

**Religion:**

**Other family members seen here:**

### INSURANCE INFORMATION

(Presentation of Insurance Card is required at time of each visit)

**Person responsible for bill:**

**Birth date:**

**Address (if different):**

**Home phone no.:**

- ( )

**Is this person a patient here?**

- [ ] Yes
- [ ] No

**Occupation:**

**Employer:**

**Employer address:**

**Employer phone no.:**

- ( )

**Is this patient covered by insurance?**

- [ ] Yes
- [ ] No

**Please indicate primary insurance**

- [ ] McGraw-Hill Healthmark Insurance
- [ ] BlueCross/Shield
- [ ] Medicare
- [ ] Medicaid (Please provide card)
- [ ] Other

**Subscriber's name:**

**Subscriber's S.S. no.:**

**Birth date:**

**Group no.:**

**Policy no.:**

**Co-payment:**

**Patient's relationship to subscriber:**

- [ ] Self
- [ ] Spouse
- [ ] Child
- [ ] Other

**Effective Date:**

**Name of secondary insurance (if applicable):**

**Subscriber’s name:**

**Group no.:**

**Policy no.:**

**Patient’s relationship to subscriber:**

- [ ] Self
- [ ] Spouse
- [ ] Child
- [ ] Other

### IN CASE OF EMERGENCY

**Name of local friend or relative (not living at same address):**

**Relationship to patient:**

**Home phone no.:**

- ( )

**Work phone no.:**

- ( )

The above information is true to the best of my knowledge. I authorize my insurance benefits be paid directly to the physician. I understand that I am financially responsible for any balance. I also authorize [Name of Practice] or insurance company to release any information required to process my claims.

**Patient/Guardian signature**

**Date**

---

**Figure 2.6** Patient registration form

http://connect.mcgraw-hill.com
The patient’s past medical, surgical, social, and family histories are collected and entered into the EHR as well. Figure 2.7 illustrates documentation in PrimeSUITE; each of the areas, when clicked on, includes more detailed information about the patient. Medication allergies, current medications, and immunization history are typically captured as part of the past medical history. The history is taken from a history form and/or the patient is asked questions in order to capture those data elements in the EHR.

The care provider then documents the history of present illness (HPI) and performs and documents a physical exam. He or she views all of this information to make an assessment of the patient (make a diagnosis) and then determines a treatment plan (also called a plan of care).

In addition, the patient’s previous health records are often used as a source of data. This information may be sent to the facility in a paper format, which is later scanned into the patient’s health record, or the information can be retrieved electronically, eventually becoming part of the patient’s record.

Check Your Understanding

1. Besides a patient’s medical, social, surgical, and family histories, what other information is captured for entry into his or her EHR?
2. Will a patient’s previous health records ever be used as a source of data?
3. Name two ways that identifying information is collected from a patient.
A health record that is in electronic form is referred to as an electronic health record (EHR) and sometimes an electronic medical record (EMR). The Office of the National Coordinator for Health Information Technology (ONC), however, differentiates between the two, based on a white paper by Garets and Davis. According to Garets and Davis, the EMR is the legal patient record that is created within any healthcare facility (hospital, nursing home, ambulatory surgery facility, physician’s office, etc.). The information in that EMR relates solely to that episode of care, and the EMR is the data source for the EHR. The individual records feed into the EHR so that healthcare providers, patients, employers, and insurance carriers can access a patient’s health records as appropriate and in accordance with Health Insurance Portability and Accountability Act (HIPAA) regulations. Only those who have a need to know should access the information found in a patient’s record.

Let us look at an example. Alison Holt is seen in the emergency room of Memorial Hospital on July 15, 2009. An EMR is compiled for that visit. She also has an EMR for an inpatient stay in Memorial Hospital from October 5 to October 10, 2009. There are additional EMRs for Alison Holt that pertain to various physician office visits and outpatient diagnostic testing. Then, in April, 2010, Ms. Holt sees a pulmonary specialist who needs to review her previous health records. Her providers and the hospitals she has been admitted to are able to share information through a Regional Health Information Organization (RHIO), which includes healthcare organizations in her area that exchange patient information in order to improve care. This health information exchange (HIE) resulted in the quick and easy sharing of her medical history with the pulmonary specialist. Her individual records thus became part of an EHR. In effect, an EHR allows for the exchange of information among caregivers and others (insurance, employers, etc.) who have a need to know, but in a secure environment and according to certain standards.

In 2003, the Institute of Medicine defined the functions of an EHR. The eight core functions are:

- health information and data
- result management
- order management
- decision support
- electronic communication and connectivity
- patient support
- administrative processes and reporting
- reporting and population health

We will no doubt continue to use the terms EMR and EHR interchangeably, but it is important to remember that in order for the benefits of the EMR to be realized, an EHR must exist. Without the EMR, the EHR, by definition, would not exist.
2.7 Laws, Regulations, and Standards

Health Insurance Portability and Accountability Act (HIPAA)

As a healthcare professional, you will get used to the fact that there are many outside influences that affect how and why we do our jobs. We will start our journey through the agencies, regulations, and laws that govern the keeping and exchange of health information with HIPAA, although many laws and standards have come before it. HIPAA stands for Health Insurance Portability and Accountability Act. HIPAA was passed on August 21, 1996, with a multifaceted purpose. It included regulations that afforded people who left their employment the ability to keep their insurance or obtain new health insurance even if they had a pre-existing medical condition. It also set standards for several aspects of storing, maintaining, and sharing electronic health information while ensuring the privacy and security of health information.

There are several rules that are addressed in HIPAA. With an effective compliance date of April 14, 2003, is the Privacy Rule. Its intent was to ensure the privacy of health information, and the use of Protected Health Information (PHI), which is information that identifies the patient. The Office of Civil Rights that enforces compliance with the Privacy Rule. The specifics of the Privacy Rule will be covered in more detail in Chapter 7, Privacy, Security, Confidentiality, and Legal Issues; however, it is important to know that electronic data collection, maintenance, use, and storage are all governed by standards, and many of these come from HIPAA. Health records are legal documents and must be compliant with state and federal regulations as well as standards set forth by accrediting agencies and insurance carriers.

In February 2003, the Security Rules were published. The deadline for facilities to implement the security rules was April 20, 2005. The security standards require health care organizations to include safeguards (administrative, physical, and technological) that ensure health information is protected, that it is kept private, and that it is retrievable in the event that the integrity of the electronic system is compromised. As noted above, Chapter 7 includes more specific information regarding the security requirements.

Hospitals, physicians’ offices, and clearinghouses (entities that process medical claims prior to payment) were required not only to submit claims (and diagnosis and procedure codes) electronically, but also to receive information, such as remittance advices, from insurance companies electronically. Compliance was required by October 23, 2003. However, yet another change is coming, and on January 1, 2012, version 5010 of the Code Set Rule will go into effect. The version 5010 HIPAA transaction upgrade is being made in part because the previous version, 4010, is several years old and has its share of problems, the use of ICD-10-PCS codes beginning in 2013 required significant revision, and version 5010 includes improved instructions for use of the National Provider Identifier (NPI) number, which is a unique identifier that must be used on insurance claims to identify the care provider and/or group practice that rendered care to the patient. The NPI implementation was the last of the original HIPAA regulations to take effect.

**HITECH Act**

The Health Information Technology for Economic and Clinical Health (HITECH) Act is part of the American Recovery and Reinvestment Act of 2009 (ARRA), which was signed into law by President Obama on February 17, 2009. The HITECH portion of ARRA is meant to increase the use of an EHR by hospitals and physicians. The incentive program, made possible through HITECH, includes $18 billion in funding for this purpose. Physicians and hospitals that show meaningful use of the information collected through use of an EHR will benefit from HITECH. The incentives can be used for implementation of new EHR systems, or upgrades to those that are already in place. Later in this text, we will demonstrate the meaningful use of data. There are three stages of meaningful use; the first is the collection and use of data, the second is the secure exchange of information, and the third is use of patient data to improve patient outcomes. Figure 2.8 depicts the HITECH interim final rule from the Health and Human Services (HHS) website.

**Office of the National Coordinator (ONC)**

From ARRA also came the Office of the National Coordinator, or ONC. The ONC was created in 2004 through a presidential order, but was later mandated by legislation (HITECH). According to the ONC website “ONC is the principal Federal entity charged with coordination of nationwide efforts to implement and use the most advanced health information technology and the electronic exchange of health information”; its mission includes:
• promoting development of a nationwide Health IT infrastructure that allows for electronic use and exchange of information that:
  – ensures secure and protected patient health information
  – improves healthcare quality
  – reduces healthcare costs
  – informs medical decisions at the time/place of care
  – includes meaningful public input in infrastructure development
  – improves coordination of care and information among hospitals, labs, physicians, etc.
  – improves public health activities and facilitates early identification/rapid response to public health emergencies
  – facilitates health and clinical research
  – promotes early detection, prevention, and management of chronic diseases
  – promotes a more effective marketplace
  – improves efforts to reduce health disparities
• providing leadership in the development, recognition, and implementation of standards and the certification of Health IT products
• health IT policy coordination
• strategic planning for Health IT adoption and health information exchange
• establishing governance for the Nationwide Health Information Network”

**NATIONAL HEALTH INFORMATION NETWORK (NHIN)**

The ultimate goal of using EHR technology is to improve patient care—sharing information to improve diagnosis, treatment, and prognosis—while doing so in an economically efficient manner. In order to share health information electronically, though, standards must be set, and policies must be adhered to. According to the ONC website, the National Health Information Network (NHIN) is “a set of standards, services, and policies that enable the secure exchange of health information over the Internet.” (National Health Information Network: Overview)

Three activities are currently available through NHIN:

*National Health Information Network Exchange*—a group of federal agencies and private organizations that are developing NHIN standards, services, and policies; they are also demonstrating live, a health information exchange.

*Direct Project*—a project aimed at developing standards and services that will enable secure exchange of information on a local level among trusted providers to support stage 1 of the meaningful use incentives, which went into effect on January 1, 2011.

*CONNECT*—free, open source software that supports health information exchange.
CERTIFICATION COMMISSION FOR HEALTH INFORMATION TECHNOLOGY (CCHIT) AND OTHER CERTIFYING AGENCIES

To ensure that health information is indeed shared securely, and that the shared information is being used for its intended purpose, the Certification Commission for Health Information Technology (CCHIT) was founded in 2004. Its purpose is to certify EHRs for functionality, interoperability, and security and it is a non-government, non-profit organization. CCHIT began certifying EHR systems in 2004, and by 2009 over 200 systems had been certified. There is reference to the importance of certification within ARRA, specifically in the area of meaningful use of health information through the adoption of a certified EHR.

The Healthcare Information and Management Systems and Society (HIMSS), a non-profit organization that focuses on the use of information technology (IT) and management systems needed to improve healthcare, provides important information regarding the EHR on its website found at http://www.himss.org/ASP/topics_ehr.asp

The Medicare and Medicaid EHR Incentive Programs require the use of certified EHR technology; a listing of certified EHR technologies can be found at http://onc-chpl.force.com/ehrcert. When you access this list, you will see that there are other EHR certifying agencies; they will be discussed further in Chapter 7.

REGIONAL EXTENSION CENTERS

As part of HITECH, extension centers are funded by the federal government. The purpose of the extension centers is to lend technical assistance and guidance regarding best practices in the selection, implementation, and maintenance of an EHR that will satisfy the meaningful use requirements. Each Regional Extension Center, or REC (pronounced R-E-C), is responsible for a geographic region within the United States and is a non-profit entity. A map is available at http://www.hhs.gov/about/regionmap.html; click on your location to see what is happening in your area.

So you can see that there are many outside entities to ensure that health information is shared so that safe, effective, quality medical care is provided, yet in a manner that allows for the security and privacy of that information exchange.

Check Your Understanding

1. CCHIT is a _____ agency.
2. Name the four subcategories of HIPAA.
3. What does PHI stand for?
4. What office ensures compliance with the Privacy Rule?
5. What does the Office of the National Coordinator (ONC) do?
6. List the three activities currently available through the National Health Information Network.
2.8 **Similarities and Differences between a Physician’s Office and Hospital Information Systems**

Regardless of the healthcare setting—inpatient or outpatient—every patient seen must have a health record that describes his or her history of present illness, past medical and surgical history, record of physical exam, record of treatment rendered, results of diagnostic tests, plan of care, and diagnoses. In a physician’s office setting, the patient schedules an appointment, which is part of the registration process. In a hospital setting, a patient may arrive without an appointment for an emergency department visit, or to have outpatient lab work done, for example. In either case, appointments would typically be unnecessary or impossible. In other instances, such as for a CT scan, which requires a significant amount of time and specially trained staff, an appointment is necessary. And, in a hospital setting, a patient may be scheduled for an elective surgery such as cholecystectomy (removal of the gall bladder).

The steps taken to capture the fact that a patient was seen, no matter what the setting, are most easily (and accurately) done using computerization. In a physician’s office, this is done using Practice Management (PM) software. In a hospital, this is called the Master Patient (person) Index (MPI) and it is part of the RADT (Registration, Admission, Discharge, Transfer) functions of the hospital’s automated information system. Each patient is entered only once into the MPI or Patient List, although there may be several visits (encounters) for each patient as a subset of the main entry. This allows the documentation of each individual visit to be filed in one place within the MPI or Patient List.

Practice Management software is used to handle the administrative functions in an office such as listing all patients who have been seen in that practice; capturing insurance and demographic information; entering charges and diagnosis and procedure codes; filing, maintenance, and follow-up of medical claims and collections (billing procedures); running statistical reports about the practice; and scheduling patients’ appointments.

The capturing of the identifying information and the clinical documentation discussed earlier in this chapter becomes part of the electronic health record in both the hospital and physicians’ offices.

The various functions performed are called by different names in different settings, but the goals are the same—registration of the patient and then compilation a health record for every encounter the patient has in that facility or office.

Table 2.2 compares common jargon used in a hospital to that used in a physician’s office.

The objective of an EHR is to capture timely, accurate, usable health information to ensure quality medical care; provide for coordination of care; support the medical necessity for diagnostic testing; protect the legal interests of the patient, provider, and hospital; collect data used in statistical reporting; and file insurance claims.
In order to select, implement, maintain, and use practice management software or the electronic health record, it is necessary to include professionals who understand not only how to use the software, but also what to look for when selecting software that will meet the stiff regulations that govern the keeping of health information. It is vitally important that this health information be maintained in a way that is private, confidential, and secure, yet readily available when needed. In addition, the information needs to be accurate, reliable, and valid. Over the past several years, the federal government has affirmed that there is an urgent need for an electronic health record that will provide for more efficient, effective, and safe healthcare for Americans.

### Check Your Understanding

1. SOAP notes are generally used in a/an _____ setting.
2. Could a patient ever have outpatient care in a hospital setting? If so, what is an episode of outpatient care called?
3. What term describes a hospital’s historical list of patients?

<table>
<thead>
<tr>
<th>Action</th>
<th>Physician’s Office or Other Outpatient Setting</th>
<th>Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient seeks care</td>
<td>Schedule patient or make an appointment</td>
<td>Register or admit a patient</td>
</tr>
<tr>
<td>Health record is compiled</td>
<td>End product is a SOAP note, progress note, or “chart”</td>
<td>End product is a health (medical) record</td>
</tr>
<tr>
<td>Listing of all patients seen by the facility</td>
<td>Once the patient is registered one time, he/she appears in the Patient List</td>
<td>Once the patient is registered one time, he/she appears in the Master Patient (person) Index (MPI)</td>
</tr>
<tr>
<td>Patient has outpatient care</td>
<td>Each is called an encounter or visit</td>
<td>Each is called an encounter</td>
</tr>
<tr>
<td>Patient stays over night</td>
<td>n/a</td>
<td>The patient is an admission or inpatient</td>
</tr>
<tr>
<td>Patient is finished with the encounter</td>
<td>Patient checks out</td>
<td>Patient is discharged</td>
</tr>
</tbody>
</table>

TABLE 2.2 Comparison of Outpatient to Inpatient Setting
<table>
<thead>
<tr>
<th>LEARNING OUTCOME</th>
<th>CONCEPTS FOR REVIEW</th>
</tr>
</thead>
</table>
| **2.1** Describe the role of six healthcare professionals who maintain or use practice management and electronic health record applications. Pages 21–23 | – Healthcare professionals, their educational background, their certifications, and how they use health information:  
• Chief Information Officer  
• Health Information Professionals  
• Chief Financial Officer  
• Healthcare Administrators/Managers/Office Administrators  
• Care Providers  
• Nurses, Medical Assistants |
| **2.2** Explain the difference between data and information. Page 23 | – Often used interchangeably  
– Data is a single fact  
– Single facts come together to form information  
– Structured vs. unstructured data |
| **2.3** Identify computer-based health information media. Pages 24–26 | – Role of the health Information Technology for Economic and Clinical Health (HITCH) Act in the adoption of an electronic health record  
– Define Personal Health Record (PHR)  
– Electronic health record includes decision support technology  
– Electronic health record includes computerized models and images  
– Electronic health record includes presentation aids  
– Electronic health record includes voice recognition technology  
– Electronic health record includes Picture Archiving and Communication Systems (PACS) |
| **2.4** Relate how screen-based data collection tools are used in healthcare. Pages 26–27 | – Hardware used to collect health information includes:  
• Desktop computers  
• Laptop computers  
• Notebook computers  
• iPad  
• iPhone  
• Personal Digital Assistants (PDA)  
– Advantages include portability and customization |
<table>
<thead>
<tr>
<th>LEARNING OUTCOME</th>
<th>CONCEPTS FOR REVIEW</th>
</tr>
</thead>
</table>
| **2.5** Demonstrate how individual data elements are collected. Pages 27–29 | - Data collected through use of forms or in person  
- Registration forms used as method of collecting patient identifying and demographic information  
- Patient history form used as method of collecting past medical, surgical, family, and social histories; allergies; medication history |
| **2.6** Describe electronic health record applications, Pages 30–31 | - Differentiate between electronic medical record (EMR) and electronic health record (EHR)  
- Role of the Office of the National Coordinator (ONC)  
- Differentiate between Regional Health Information Organization (RHIO) and Health Information Exchange (HIE)  
- List the functions of the EHR as detailed by the Institute of Medicine (IOM) |
| **2.7** Identify laws, regulations, and standards that govern electronic health information. Pages 31–34 | - Identify the privacy, security, transactions, and code set rules of HIPAA  
- Define Protected Health Information (PHI)  
- Define National Provider Identifier (NPI) number  
- Describe the Health Information Technology for Economic and Clinical Health (HITECH) Act and its role in requiring electronic health records  
- Define meaningful use of data collected through use of an EHR  
- Describe the purpose of the Office of the National Coordinator (ONC)  
- Explain the National Health Information Network (NHIN)  
- Explain the Certification Commission for Health Information Technology (CCHIT)  
- Relate the purpose of Regional Extension Centers (REC) |
| **2.8** Distinguish between practice management software and hospital health information software. Pages 35–36 | - Describe the functions of Practice Management software  
- Differentiate between RADT systems and EHR systems within a hospital setting  
- Discuss the use of a Master Patient (Person) Index and Patient List  
- Articulate the purpose of an EHR |
MATCHING QUESTIONS

Match the terms on the left with the definitions on the right.

1. [LO 2.2] data  a. staff member who uses EHR software
2. [LO 2.5] progress note  b. entering or editing information about a patient
3. [LO 2.6] electronic medical record (EMR)  c. staff member whose responsibilities may include management of the EHR and other office systems to ensure efficient claims management and compliance with meaningful use requirements.
4. [LO 2.1] office administrator  d. use of health information in an effective and efficient manner to improve patient care
5. [LO 2.7] meaningful use  e. a single fact often used interchangeably with information
6. [LO 2.3] clinical decision support  f. comprehensive record of all health records for a patient which can be shared electronically with other healthcare providers as necessary
7. [LO 2.8] Master Patient Index  g. method of accessing current treatment options for a disease, through electronic or remote methods
8. [LO 2.1] medical assistant  h. documentation that usually contains the patient’s chief complaint, history of present illness, results of physical exam, assessment, and plan.
9. [LO 2.5] capture  i. record of the names of all patients seen in a hospital setting
10. [LO 2.6] electronic health record (EHR)  j. legal patient record for a single instance of treatment

MULTIPLE-CHOICE QUESTIONS

Select the letter that best completes the statement or answers the question:

1. [LO 2.7] The acronym HIE stands for:
   a. health information exchange.
   b. hospital information exchange.
   c. health information electronically.
   d. hospital institutional exchange.
2. **[LO 2.4]** An advantage of using screen-based data collection tools is that the layout of the information can be:
   a. printed.
   b. deleted.
   c. shredded.
   d. customized.

3. **[LO 2.6]** The _____ defined the eight core functions of an EHR.
   a. National Institute of Health
   b. American Recovery and Reinvestment Act
   c. Institute of Medicine
   d. HITECH Act

4. **[LO 2.7]** Which of the following is a goal of HIPAA?
   a. establish standards for keeping of health care information
   b. ensure patients receive timely treatment
   c. allow a person’s insurance to transfer from one job to another
   d. to guide how Picture Archiving and Communication Systems are used

5. **[LO 2.5, 2.8]** In a physician’s office, patient data collection begins when:
   a. the patient exam begins.
   b. the patient calls to make an appointment.
   c. the medical assistant takes the patient’s vital signs.
   d. the patient signs in at the front desk.

6. **[LO 2.3]** An advantage of EHRs is that patients are now able to _____ about procedures they are undergoing.
   a. hear lectures
   b. see diagrams
   c. ask questions
   d. view videos

7. **[LO 2.2]** Knowing that Jim Smith had a heart attack when he was 53 is an example of:
   a. data.
   b. information.
   c. support.
   d. technology.

8. **[LO 2.8]** When patients are finished with their encounter at a hospital, they:
   a. are admitted.
   b. check out.
   c. complete a SOAP note.
   d. are discharged.
9. [LO 2.7] If a hospital uses information gathered through their EHRs to justify the purchase of state-the-art equipment to improve patient care, they are:
   a. violating the Privacy Rule.
   b. engaging in meaningful use.
   c. abusing Protected Health Information.
   d. following CCHIT.

**SHORT ANSWER QUESTIONS**

1. [LO 2.1] List and define the roles of the six healthcare professionals involved in EMR use.
2. [LO 2.7] What is the purpose of CCHIT?
3. [LO 2.1] Explain the differences between a healthcare administrator, healthcare manager, and health systems administrator.
4. [LO 2.3] What does PACS stand for?
5. [LO 2.8] List five objectives of an EHR.
6. [LO 2.7] HIPAA is an acronym for _____.
7. [LO 2.6] Contrast an EHR with an EMR.
8. [LO 2.6] List the eight core functions of an EHR as defined by the Institute of Medicine.
9. [LO 2.2] Explain the difference between data and information, and give an example of each.
10. [LO 2.3] Why were so many physicians opposed to clinical decision support in the past?
11. [LO 2.5] List the four types of histories entered into a patient’s electronic record.
12. [LO 2.4] Name two advantages of using screen-based data collection tools.
13. [LO 2.1] If someone has the letters “RHIA” after his or her name, what does that mean?
14. [LO 2.8] What does the ADT acronym mean in a hospital setting?
15. [LO 2.7] Explain the purpose of a Regional Extension Center (REC).
16. [LO 2.3] List one way that voice recognition technology can be used in a medical setting.

**APPLYING YOUR KNOWLEDGE**

1. [LOs 2.3, 2.4, 2.6, 2.7] Discuss any potential drawbacks to the full-scale use of EHRs, and explain what precautions or regulations have been put in place to deal with each drawback.
2. [LO 2.7] Incentives are a significant part of the HITECH Act. Discuss the advantages and potential disadvantages associated with using incentives as a tool for implementing EHRs.

3. [LOs 2.2, 2.5] In the following case study, determine what would be considered data and what would be considered information: New patient Alice Jones is a 32-year-old female who presents with chest pains. She tells you that, in the past, she has been diagnosed with rosacea and is allergic to latex. In addition, she has had surgery for a broken arm. She does not smoke; is a social drinker; and has no family history of heart problems.

4. [LO 2.8] A physician’s office and a hospital employ different terminology and process flow when maintaining records and monitoring patient flow. Why is there no set protocol that is used by all health-care settings?

5. [LO 2.4] Describe a scenario where presentation software might be used in a physician’s office practice.