Defining the Basics of Health Informatics for HIM Professionals - Retired

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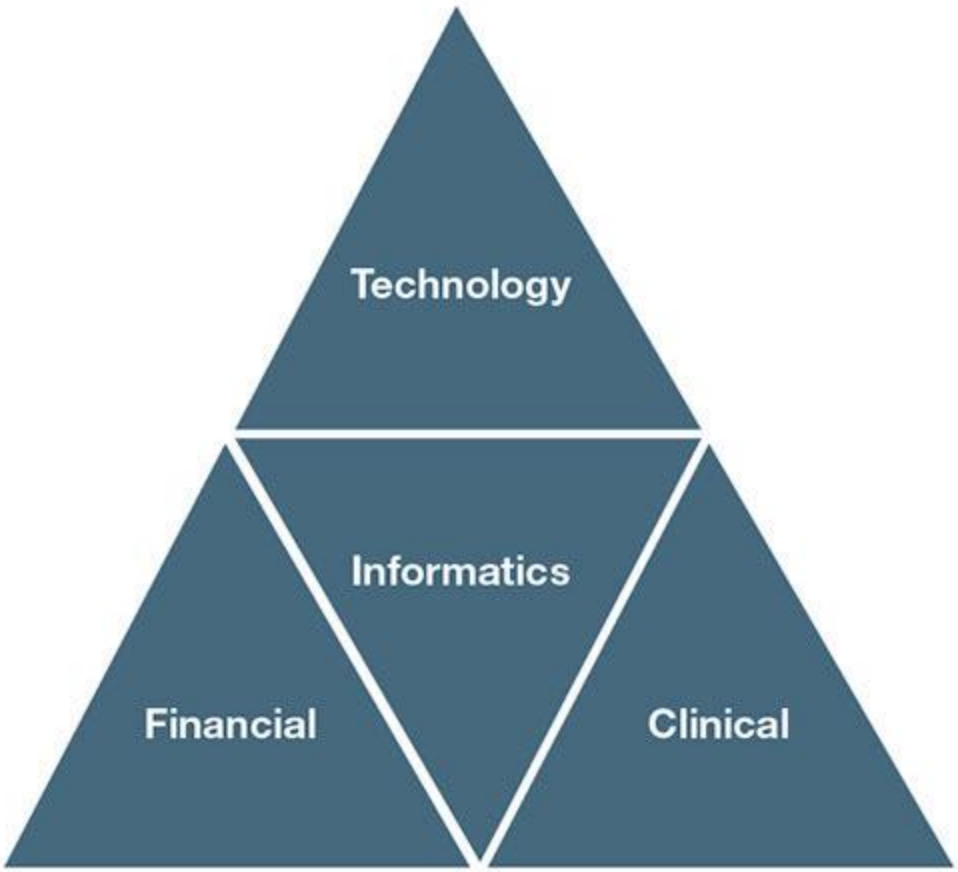
All data are not created equal and technology implementation alone is not enough to improve the healthcare provided to patients. Providers and organizations must be able to distinguish between an abundance of data, meaningful data, and integration of data. Healthcare organizations are challenged to meet these data dilemmas in their daily practices and workflow, where new technologies and treatment modalities are changing and evolving at a rapid rate.

The process of organizing, storing, integrating, and retrieving medical and patient information has traditionally been managed through paper-based systems. The dilemma is that paper-based systems have evolved into disparate and proprietary systems with limited functionality. Healthcare has done a good job capturing data, but the unintended consequence is that the proliferation of electronic data and the expanded use of electronic health records (EHRs) have vastly increased the volume of available health information and the speed at which it is communicated. The human capacity to digest, interpret, and act on such information in an efficient manner, however, has not evolved as quickly. The need for health informatics has never been greater. This practice brief provides an overview of health informatics basics and includes a glossary of terms that are commonly associated with the field.

Basic Conceptual Framework of Health Informatics



Defining Health Informatics

Health informatics can be defined in two different ways:

- A scientific discipline that is concerned with the cognitive, information-processing, and communication tasks of healthcare practice, education, and research, including the information science and technology to support these tasks[1]
- A field of information science concerned with the management of all aspects of health data and information through the application of computers and computer technology[2]

The American Medical Informatics Association (AMIA) has defined clinical informatics as the application of informatics and information technology to deliver healthcare services.[3] It includes a wide range of topics from clinical documentation to provider order entry systems and from system design to system implementation and adoption issues.[4] The field of informatics includes a number of related areas such as translational bioinformatics, clinical research informatics, consumer health informatics, and public health informatics.[5]

Each discipline-specific area—such as nursing or pharmacy—within the overall sphere of informatics in healthcare has specific needs. Informatics in nursing, for example, focuses on issues such as tracking and documenting nursing care by using information technology.

Having too much data may be worse than not having enough when it comes to making strategic healthcare decisions. Health informatics enables health information management professionals to gather and analyze large amounts of data into useful information and is poised for a period of rapid growth and expansion as the healthcare industry continues to evolve and produce an increasing amount of yet-unharnessed data power. A multitude of external forces and trends such as pressure to contain rising healthcare costs, expansion of information exchange, tracking and reporting meaningful use of EHR criteria, and reduction of medical errors all call for the application of informatics.

Potential Career Progression for a Health Informatics Professional

Health informatics professionals can provide organizations and providers with the experience and knowledge required to pull meaningful information from a multitude of sources. These professionals are chiefly responsible for gathering and analyzing patient health details and compiling them for review by clinical care providers. In addition, the health informatics professional can ensure that the correct data is collected and presented in a readable format. This graphic shows what degrees HIM professionals need to work in various areas of the profession, including informatics.

Associate Degree

- Registered Health Information Technician
- Medical Transcriptionist
- Data Entry Specialist

Bachelor Degree

- Registered Health Information Administrator
- Informatics Nurse Specialist
- System Data Analyst

Advanced Degree

- Master Degree or Certificate in Biomedical Informatics
- Master Degree in Health Informatics
- Certified Health Data Analyst (CHDA) Credential
- Epidemiologist
- Statistician
- Informaticist

Informatics Helps Harness the Power of Data for Healthcare Improvement

Health informatics is an interdisciplinary field of study that utilizes technology to organize, analyze, manage, and use information to improve healthcare. Its chief goals are to develop standards and clinical care guidelines that enhance electronic health records by facilitating information management.

Health informatics as a discipline traces its roots back to the 1940s in Europe, but it did not begin to take root in the United States until the mid 1970s. Today, many organizations recognize informatics as an important field in medicine and health sciences.

Applied health informatics has the potential for extensive benefits for the healthcare industry, from decreasing admission wait times to reducing duplication of tests. Public health informatics will become increasingly important to the management of public and population health. More data will be available for analysis with the increase of electronically generated and stored data.

Glossary of Terms Relevant to Health Informatics

Agency for Healthcare Research and Quality (AHRQ)

The branch of the United States Public Health Service that supports general health research and distributes research findings and treatment guidelines with the goal of improving the quality, appropriateness, and effectiveness of healthcare services.

American Recovery and Reinvestment Act of 2009 (ARRA)

The purposes of this act include:

- Preserve and create jobs and promote economic recovery.
- Assist those most impacted by the recession.
- Provide investments needed to increase economic efficiency by spurring technological advances in science and health.
- Invest in transportation, environmental protection, and other infrastructures that will provide long-term economic benefits.
- Stabilize state and local government budgets in order to minimize and avoid reductions in essential services and counterproductive state and local tax increases.

Analysis

Review of the health record for proper documentation and adherence to regulatory and accreditation standards.

Beacon Community Cooperative Agreement Program

This program demonstrates how health IT investments and meaningful use of EHRs advance the vision of patient-centered care, while achieving the three-part aim of better health, better care, and lower cost. The Office of the National Coordinator for Health IT (ONC) is providing $250 million over three years to 17 selected communities throughout the United States that have already made inroads in the development of secure, private, and accurate systems of EHR adoption and health information exchange.[7]

Biomedical Informatics

A field of study concerned with the broad range of issues in the management and use of biomedical information, including biomedical computing and the study of the nature of biomedical information itself. Formerly called medical informatics, the new name is intended to clarify that the domain encompasses biological and biomolecular informatics as well as clinical, imaging, and public health informatics.[8] Biomedical informatics is the interdisciplinary field that studies and pursues the effective uses of biomedical data, information, and

knowledge for scientific inquiry, problem solving, and decision making, motivated by efforts to improve human health.[9] It's the use of information technology for assimilating, gathering, organizing, analyzing, and presenting healthcare-related data to produce information for decision support to improve quality of care, decrease costs, enhance patient safety, and increase interoperability. Health information technology is the tool and information is the outcome.

Biomedical Research

The process of systematically investigating subjects related to the functioning of the human body.

Centers for Disease Control and Prevention (CDC)

A federal agency dedicated to protecting health and promoting quality of life through the prevention and control of disease, injury, and disability. Committed to programs that reduce the health and economic consequences of the leading causes of death and disability, thereby ensuring a long, productive, and healthy life for all people.

Centers for Medicare and Medicaid Services (CMS)

The Department of Health and Human Services (HHS) agency responsible for Medicare and parts of Medicaid. Historically, CMS has maintained the UB-92 institutional electronic media claims (EMC) format specifications, the professional EMC NSF specifications, and specifications for various certifications and authorizations used by the Medicare and Medicaid programs. CMS is responsible for the oversight of HIPAA administrative simplification transaction and code sets, health identifiers, and security standards. CMS also maintains the HCPCS medical code set and the Medicare Remittance Advice Remark Codes administrative code set.

Certification Commission for Healthcare Information Technology (CCHIT)

An independent voluntary private-sector initiative organized as a limited liability corporation that has been awarded a contract by HHS to develop, create prototypes for, and evaluate the certification criteria and inspection process for electronic health record (EHR) products.

Certified Health Data Analyst (CHDA)

AHIMA credential awarded to individuals who have demonstrated skills and expertise in health data analysis.

Certified in Healthcare Privacy and Security (CHPS)

AHIMA credential that recognizes advanced competency in designing, implementing, and administering comprehensive privacy and security protection programs in all types of healthcare organizations. Requires successful completion of the CHPS exam sponsored by AHIMA.

Clinical Analytics

The process of gathering and examining data in order to help gain greater insight about patients.

Clinical Data Analytics

The process by which health information is captured, reviewed, and used to measure quality.

Clinical Decision Support

The process in which individual data elements are represented in the computer by a special code to be used in making comparisons, trending results, and supplying clinical reminders and alerts.

Clinical Document Architecture (CDA)

A Health Level Seven (HL7) XML-based document markup standard for the electronic exchange model for clinical documents (such as discharge summaries and progress notes). The implementation guide contains a library of CDA templates, incorporating and harmonizing previous efforts from HL7, Integrating the Healthcare Enterprise, and Health Information Technology Standards Panel (HITSP). It includes all required CDA templates for stage 1 of the "meaningful use" EHR Incentive Program and HITECH final rule. It is commonly referred to as Consolidate CDA or C-CDA.

Clinical Documentation Improvement (CDI)

The process an organization undertakes that will improve clinical specificity and documentation that will allow coders to assign more concise disease classification codes.

Clinical Documentation Improvement Plan

A program in which specialists concurrently review health records for incomplete documentation, prompting clinical staff to clarify ambiguity which allows coders to assign more concise disease classification codes.

Clinical Document Improvement Practitioner (CDIP)

AHIMA credential awarded to individuals who have achieved specialized skills in clinical documentation improvement.

Clinical Terminology

A set of standardized terms and their synonyms that record patient findings, circumstances, events, and interventions with sufficient detail to support clinical care, decision support, outcomes research, and quality improvement.

Commission on Accreditation of Health Informatics and Information Management Education (CAHIIM)

An independent accrediting organization whose mission is to serve the public interest by establishing and enforcing quality accreditation standards for health informatics and health information management educational programs.

Commission on Certification for Health Informatics and Information Management (CCHIIM)

An independent body within AHIMA that establishes and enforces standards for the certification and certification maintenance of health informatics and information management professionals.

Comparative Effectiveness Research (CER)

Research that generates and synthesizes evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care.

Computer-Assisted Coding (CAC)

The process of extracting and translating dictated and then transcribed free-text data (or dictated and then computer-generated discrete data) into ICD-9-CM and CPT evaluation and management codes for billing and coding purposes.

Computerized Provider Order Entry (CPOE)

Electronic prescribing systems that allow physicians to write prescriptions and transmit them electronically. These systems usually contain error prevention software that provides the user with prompts that warn against the possibility of drug interaction, allergy, overdose, and other relevant information.

Covered Entity (CE)

As amended by HITECH, a covered entity may be defined as a health plan, a healthcare clearinghouse, or a healthcare provider who transmits any health information in electronic form in connection with a transaction covered by HITECH.

Data Analytics

The science of examining raw data with the purpose of drawing conclusions about that information. This includes data mining, machine language, development of models, and statistical measurements. Analytics can be descriptive, predictive, or prescriptive.

Data Dictionary

A descriptive list of the names, definitions, and attributes of data elements to be collected in an information system or database whose purpose is to standardize definitions and ensure consistent use.

Data Governance

The overall management of the availability, usability, integrity, and security of the data employed in an organization or enterprise.9

Data Mapping

Data mapping allows for connections between two systems. This connection allows for data initially captured for one purpose to be translated and used for another purpose. One system in a map is identified as the source while the other is the target. It is a process by which two distinct data models are created and a link between these models is defined. This process is used in data warehousing by which different data models are linked to each other using a defined set of methods to characterize the data in a specific definition. This definition can be any atomic unit, such as a unit of metadata or any other semantic. This data linking follows a set of standards, which depends on the domain value of the data model used. Data mapping serves as the initial step in data integration.

Data Mining

The process of extracting and analyzing large volumes of data from a database for the purpose of identifying hidden and sometimes subtle relationships or patterns and using those relationships to predict behaviors.

Data Stewardship

The responsibilities and accountabilities associated with managing, collecting, viewing, storing, sharing, disclosing, or otherwise making use of personal health information.

Decision Support System (DSS)

A computer-based system that gathers data from a variety of sources and assists in providing structure to the data by using various analytical models and visual tools in order to facilitate and improve the ultimate outcome in decision making tasks associated with non-routine and non-repetitive problems.

Descriptive Statistics

A set of statistical techniques used to describe data such as means, frequency distributions, and standard deviations; statistical information that describes the characteristics of a specified group or a population.

Enterprise Information Management (EIM)

Ensuring the value of information assets, requiring an organization-wide perspective of information management functions, calls for explicit structures, policies, processes, technology, and controls. EIM is the infrastructure and processes in place to ensure information is trustworthy and actionable.

Health Informatics

Scientific discipline that is concerned with the cognitive, information-processing, and communication tasks of healthcare practice, education, and research, including the information science and technology to support these tasks.

Health Informatics and Information Management (HIIM)

Refers to the individuals responsible for the management of healthcare data and information in paper or electronic form and control the collection, access, use, exchange, and protection of the information through the application of health information technology.

Health Information Technology

A term that encompasses the technical roles that process health data and records, such as classification, abstracting, and retrieval.[10] Under HITECH, health IT is defined as hardware, software, integrated technologies or related licenses, intellectual property, upgrades, or packaged solutions sold as services that are designed for, or support the use by, healthcare entities or patients for the electronic creation, maintenance, access, or exchange of health information.

Healthcare Cost and Utilization Project (HCUP)

A family of databases and related software tools and products developed through a federal-state-industry partnership and sponsored by AHRQ. HCUP databases are derived from administrative data and contain encounter-level, clinical, and nonclinical information including all listed diagnoses and procedures, discharge status, patient demographics, and charges for all patients, regardless of payer, beginning in 1988.

Healthcare Effectiveness Data and Information Set (HEDIS)

A set of standard performance measures that can give an individual information about the quality of a health plan. One can find out about the quality of care, access, cost, and other measures to compared managed care plans. CMS collects HEDIS data for Medicare plans.

Informatics

A field of study that focuses on the use of technology to improve access to, and utilization of, information.

Information Governance (IG)

The accountability framework and decision rights to achieve enterprise information management (EIM). IG is the responsibility of executive leadership for developing and driving the IG strategy throughout the organization. IG encompasses both data governance and information technology governance.

Information Technology Governance (ITG)

Led by the chief information officer (CIO), the process to ensure the effective evaluation, selection, prioritization, and funding of competing IT investments. ITG oversees the implementation of these investments and extracts business benefits.[11]

International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM)

The coding classification system that will replace ICD-9-CM, Volumes 1 and 2, on October 1, 2015. ICD-10-CM is the United States' clinical modification of the World Health Organization's ICD-10. ICD-10-CM has a total of 21 chapters and contains significantly more codes than ICD-9-CM, providing the ability to code with a greater level of specificity.

International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS)

The coding classification system that will replace ICD-9-CM, Volume 3, on October 1, 2015. ICD-10-PCS has 16 sections and contains significantly more procedure codes than ICD-9-CM, providing the ability to code procedures with a greater level of specificity.

Interoperability

The capability of different information systems and software applications to communicate and exchange data.

Machine Learning

An area of computer science that studies algorithms and computer programs that improve employee performance on some task by exposure to training or learning experience.

Medical Informatics

A field of information science concerned with the management of data and information used to diagnose, treat, cure, and prevent disease through the application of computers and computer technologies.[12]

Natural Language Processing (NLP)

A technology that converts human language (structured or unstructured) into data that can be translated and then manipulated by computer systems; a branch of artificial intelligence.

Office of the National Coordinator for Health Information Technology (ONC)

The principle 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. The position of the National Coordinator was created in 2004, through an Executive Order, and legislatively mandated in the HITECH Act of 2009.

Predictive Modeling

A process used to identify patterns that can be used to predict the odds of a particular outcome based on the observed data.

Semantic Interoperability

Mutual understanding of the meaning of data exchanged between information systems.

Telehealth

A telecommunications system that links healthcare organizations and patients from diverse geographic locations and transmits text and images for medical consultation and treatment.

Assisting with the Triple Aim

In 2006 the Agency for Healthcare Research and Quality (AHRQ) received a report from the Southern California Evidenced-based Practice Center stating that approximately 50 percent of the nation's healthcare costs were wasted on inefficient processes. Health informatics can assist with improving the patient experience of care, improving the health of populations, and reducing the per capita cost of healthcare—three goals also known as the "Triple Aim."[6]

As a multidisciplinary field, gathering data from multiple clinical, financial, and administrative systems is important to be able to sort through volumes of data for health intelligence purposes. Some other advantages of health informatics are the ability to improve EHR functionality, improve information exchange that follows the patient through the continuum of care, and analyze trends from a larger population mass.

Management of Health Data Continues to Pose Challenges

The modern healthcare industry struggles to manage data. In the quest for data, EHRs have been created to import large amounts of data, storing every keystroke and data point. In fact, in today's era of Big Data, frivolous, meaningless, and unstructured data is collected and stored next to meaningful data. While computers and hard drives are exceptional at sorting through mounds of structured data, humans are not. Computers cannot distinguish good data from bad data and unstructured data is more difficult to parse. Human interaction is required to interpret the data. It is essential to balance usability with functionality.

In addition, healthcare professionals lack background and understanding of data science. This fact further complicates the copious amounts of data entered without the appreciation for the potential that data could yield.

Critical challenges in health informatics are evolving today in the United States. Challenges include inadequate staffing resources, lack of alignment, abstract financial incentives, and lack of system integration and interoperability. These challenges must be overcome in order to successfully achieve healthcare reform and patient safety initiatives, and to demonstrate improved quality of care with reduced cost in the United States.

Notes

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