Clinical Terminology: Expanding Career Pathways for HIM Professionals - Retired

Save to myBoK

Healthcare is an evolving world where data is central to all aspects of care. It is an information-intensive environment where data analysis is used to make decisions about the quality and safety of patient care, public health programs, and healthcare reform. At the core of many of these analyses is the use of clinical terminologies that capture discrete data at the most granular level. It is important for health information management (HIM) professionals to understand the role clinical terminologies play in this "Big Data" environment. Understanding in this area leads to new opportunities and career paths for coding professionals and clinical data analysts.

This Practice Brief examines how HIM professionals can engage in continuing education to prepare for roles in the clinical terminology arena. HIM professionals may extend their knowledge in clinical terminologies for expanded job functions in current roles or for movement into new positions that concentrate on clinical terminologies and their uses. This Practice Brief will:

- Highlight SNOMED CT, RXNorm, and LOINC, three of the clinical terminologies more commonly used today
- Discuss the responsibilities and skill sets for new and emerging roles
- Provide guidance to prepare for career advancement in the clinical terminologies arena
- Describe potential career paths in clinical terminologies

Many HIM professionals are exposed to coding and code sets during their education. This exposure includes ICD-10-CM/PCS, CPT, and perhaps HCPCS Level II. Beyond the typical code sets are numerous classifications, vocabularies, and clinical terminologies. Although all classifications, vocabularies, and clinical terminologies are not identical in structure, conventions, or purpose, they do have some commonalities that allow a professional that is experienced in one set to grasp concepts of another set in an expedited fashion. Building on their HIM education, professionals can transition into new roles that move beyond coding and enter the realm of information governance (IG) and data analysis in which clinical terminologies are significant.

This is echoed in AHIMA's new initiative HIM Reimagined.[1] The initiative speaks to the ever-increasing use of Big Data in the healthcare industry and the movement from producing data to managing and interpreting data. It's time for working learners to build or expand their knowledge in the terminology arena to be competitive in the IG and analysis opportunities in this data-rich environment.

So what is the difference between terminologies, vocabularies, and classifications? Many people use these terms interchangeably, although each term has a separate and distinct definition and purpose in healthcare. *The Pocket Glossary of Health Information Management and Technology* defines clinical terminology as:

> A clinical terminology represents the terms, expressions, designations, or symbols used in the field of medicine. It is used to record patient findings, circumstances, events, and interventions with sufficient detail to support clinical care, decision support, outcomes research, and quality improvement.

Vocabularies are different from clinical terminologies in that they are a collection of clinical words or phrases with their meanings.[2] Therefore, clinical terminologies and vocabularies provide structure to data for primary data use or input into electronic records. Classifications arrange clinical terminologies or vocabularies into related groups or categories based on common factors. Classifications often turn clinical terminologies and/or vocabularies into structured data that can be used for secondary data uses, such as data analytics, reporting, reimbursement, fraud detection, or population health. See Figure 1 below for an illustration of how these terms are related. Appendix A contains a list of the classifications, clinical terminologies, and vocabularies more commonly used today.

Figure 1: Relationship Between Terminology, Vocabulary, and Classification
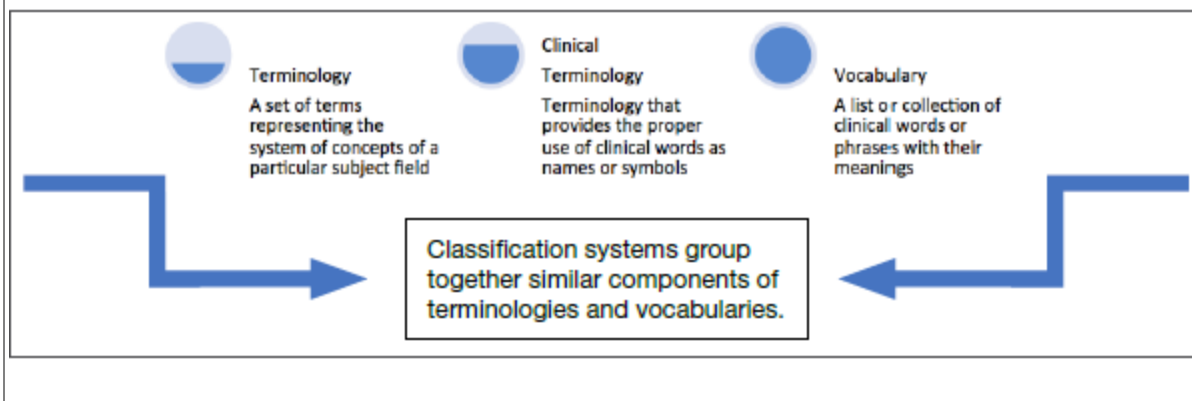
In some cases, this Practice Brief may use clinical terminology and vocabulary interchangeably based on the way the references used to source information refer to the systems being described.

HIM professionals have a unique skill set that provides a foundation to work with clinical terminologies due to HIM's educational background in medical terminology, anatomy and physiology, pathology and disease, and procedure coding. The Clinical Terminology Roles section of this Practice Brief, which starts below, gives several examples of clinical terminology roles, such as terminology mapper and terminology asset manager. HIM professionals—specifically, coding professionals— have experience in reading and analyzing clinical documentation to accurately describe a patient's care via coded data. This experience with clinical information provides HIM professionals with a baseline understanding of the concepts required to move into the clinical terminology arena.

IG and health informatics play a critical role in HIM education and in return prepare HIM professionals with the unique skills required in the technology sector of healthcare. It is imperative that both structural and content standards are utilized to ensure interoperability, resulting in a uniform data exchange format that is effective and efficient. IG is pivotal to the proper collection, storage and retrieval, communication, and use of data derived from clinical terminologies. Optimizing the value of information is an essential element of IG. Value is enhanced when information is shared.

Review of Selected Terminologies

The Centers for Medicare and Medicaid Services' (CMS) "meaningful use" Electronic Health Record (EHR) Incentive Program stimulated the application of standardized clinical terminologies to meet the need for semantic interoperability. Meaningful use requirements include promoting the exchange of health data across information systems as well as supporting the electronic reporting of clinical quality measures. The following gives an overview of three common terminologies' structure, content, and uses.

SNOMED CT

SNOMED CT is a comprehensive and multilingual clinical terminology comprised of descriptive terms adopted by healthcare systems throughout the world. It is a controlled terminology with a predefined set of terms and meanings integrated into healthcare software applications.

SNOMED CT represents a standardized method to capture clinical terms for diagnoses, procedures, treatments, medications, body structures, specimens, and more. SNOMED CT core components are concepts, descriptions, and relationships.

Concepts represent a specific idea or thought which describe clinical data in health records, Health Level Seven (HL7) messages, and databases. Concepts are organized into hierarchies with each descending level of the hierarchy being more specific. "Finding" is a top-level concept with "disorder" as a second-level concept. "Myocardial infarction on electrocardiogram" is an example of a finding concept with "acute myocardial infarction" being an example of a disorder concept. Concepts are displayed as unique and permanent numeric identifiers, ranging from eight to 18 digits with no inherent meaning. For example, 22298006 represents myocardial infarction and 42343007 represents congestive heart failure.

Descriptions are terms or text for concepts, expressed as readable names and synonyms. Each concept has only one Fully Specified Name, which describes an unambiguous meaning for the concept. Concepts may have multiple synonyms, which represent acceptable terms used to display or select a concept with at least one synonym designated as Preferred. For example:

- *Fully specified name:* Myocardial infarction (disorder)
- *Preferred term:* Myocardial infarction
- *Synonym:* Cardiac infarction
- *Synonym:* Heart attack
- *Synonym:* Infarction of heart
- *Synonym:* MI – Myocardial infarction
- *Synonym:* Myocardial infarct

Relationships connect two or more concepts. Relationships are expressed as |is a| relationships and attribute relationships. The |is a| relationship joins a concept to more general concepts, and it defines the hierarchy of SNOMED CT concepts. The attribute relationship provides additional information about the concept's meaning, thus decreasing the ambiguity of the concept's definition.

In Figure 2 below, the |is a| relationships are Myocardial necrosis (finding), Myocardial disease (disorder), Ischemic heart disease (disorder), and Necrosis of anatomical site (disorder). There are two attribute relationships: Infarct (morphologic abnormality) and Myocardium structure (body structure).

Figure 2: Myocardial Infarction Structure
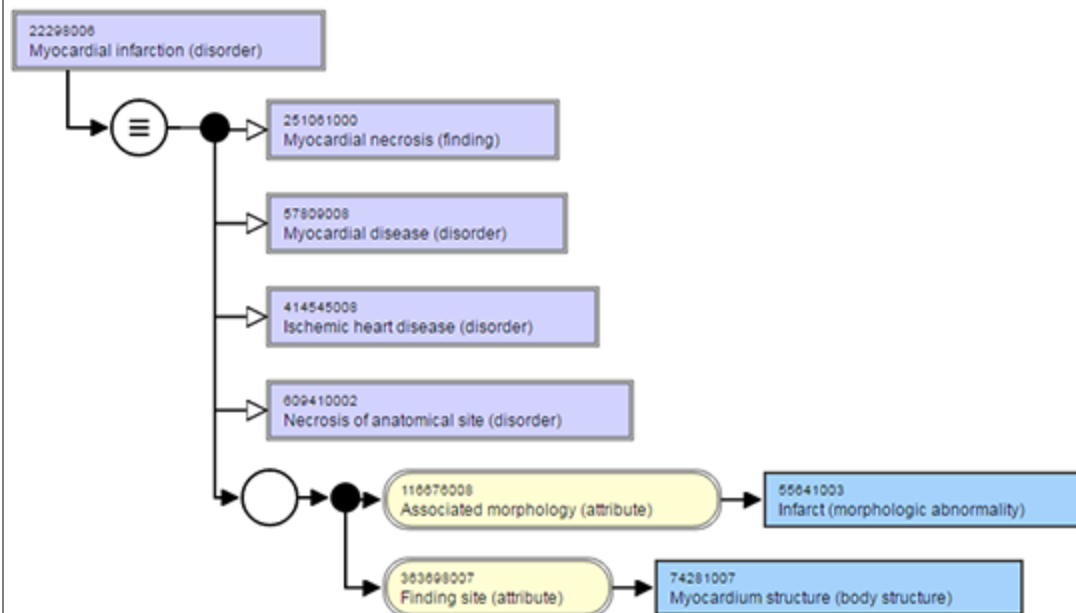
Source: SNOMED International. "SNOMED International SNOMED CT Browser." 2017. http://browser.ihtsdotools.org.

SNOMED CT encodes clinical data contained in the EHR and is critical for semantic interoperability, maintaining the meaning of clinical data exchanged among information systems. SNOMED CT is used to capture data elements in the Meaningful Use Common Clinical Data Set for smoking status, problems, encounter diagnosis, procedures, family health history, and cancer case information for transfer to cancer registries.

SNOMED International, formerly known as the International Health Terminology Standards Development Organisation (IHTSDO), is a non-profit organization that is the current owner, administrator, and developer of SNOMED CT. Content development is dynamic and includes new concepts, descriptions, and relationships as well as updates and retirements to core components.

The National Library of Medicine (NLM) represents the United States for SNOMED International and distributes the US version of SNOMED CT via Unified Medical Language System Terminology Services. NLM also supports an online application for submitting requests for new or revised concepts. Updates to the United States edition of SNOMED CT are released biannually in March and September.

LOINC

LOINC, which stands for Logical Observation Identifiers Names and Codes, is a common terminology, consisting of identifiers, names, and codes for laboratory and clinical observations. LOINC is owned and maintained by the Regenstrief Institute, a non-profit medical research organization associated with Indiana University. According to Dr. Daniel Vreeman, director, LOINC and health data standards at Regenstrief Institute, "LOINC® codes are universal identifiers for things you can observe."[3]

For the LOINC laboratory section, consider "specimens" that are tested, measured, or observed. The usual categories of chemistry, hematology, serology, microbiology (including parasitology and virology), toxicology, molecular genetics, cell counts, and antibiotic susceptibilities are included. This section includes single tests and standardized order panels. LOINC creates a fully specified name (FSN) with a unique code representing the computer-interpretable identifier for a concept, which is sequentially assigned without any embedded meaning.

The general form of a Lab LOINC name is <analyte/component> : <property> : <timing> : <system (sample)> : <scale> : <method>. All parts are mandatory, except method. Each part has varying values with defined abbreviations; <method> identifies the procedure used to make the measurement or observation, such as manual count.

Consider for example: 2947-0 *represents* SODIUM:SCnc:PT:BLD:Qn

- Component: Sodium
- Property: SCnc (substance concentration)
- Timing: PT (point in time)
- System: BLD (BLD)
- Scale: Qn (quantitative)

For the LOINC clinical section, visualize "patients." Observations include items such as vital signs, fluid intake/output, examination findings, EKG, endoscopy procedures, and survey instruments like the Glasgow Coma Scale. Standardized patient assessment instruments such as Minimum Data Set (MDS) and Outcomes and Assessment Information Set (OASIS) are also represented in LOINC.

RELMA (Regenstrief LOINC Mapping Assistant) is a software application used for browsing the LOINC database and mapping tests and observations performed locally to LOINC codes. There is also an online browser that allows users to search and create an Excel exported file for selected codes. LOINC may be downloaded and used free of charge, with a license agreement prohibiting any changes to LOINC content and creation of another vocabulary standard using LOINC content. In 2013, Regenstrief and SNOMED International (then IHTSDO) formed a collaborative relationship to facilitate using SNOMED CT and LOINC.

CMS requires the use of LOINC to report non-lab diagnostic tests, patient preferences, and functional status in electronic quality measures. LOINC is also used by large commercial laboratories, such as LabCorp, insurance companies, and clinical decision making applications as a terminology standard for sharing, aggregating, and processing data.

RxNorm

RxNorm is a single controlled drug terminology supporting semantic interoperability among multiple drug terminologies. It lists normalized names for clinical drugs with linking to various drug vocabularies used in pharmacy management and drug interaction systems. The result is the ability of RxNorm to facilitate messages between proprietary information systems which don't use the same software and vocabulary to support e-prescribing.

NLM produces RxNorm and provides access to the RxNorm data files and a browser through UMLS Terminology services. RxNorm is the single drug terminology standard used in the EHR, and it is backward compatible with the National Drug Code (NDC) used in retail pharmacy transactions to report drugs and biologicals as mandated by HIPAA regulations for transaction and code sets.

RxNorm includes prescription and over-the-counter drugs as well as the devices used to administer medications. The RxNorm concept unique identifier (RXCUI) is the unique permanent identifier of a concept read and understood by computers. RxNorm states relationships to synonyms and ingredients, NDC, manufacturer, and pill size attribute for each drug product.

It allows for identifying drug information at various levels:

- Semantic Clinical Drug Component: ingredient + strength (i.e., Acetaminophen 500 mg)
- Semantic Clinical Drug Form: ingredient + dose form (i.e., Acetaminophen Oral Tablet)
- Semantic Clinical Drug or Branded Drug: ingredient + strength + dose form group (i.e., Acetaminophen 500 mg Oral Tablet)

Clinical Terminology Roles

Clinical terminology is a key element in connecting data, systems, and healthcare delivery functions and encompassing attributes such as documentation, reporting, data analysis, and reimbursement. As the healthcare domain continues toward electronic and digital documentation, and the need for individuals with expertise in terminologies, vocabularies, and classifications grows, HIM professionals have the education and comprehensive understanding of the healthcare system to transition into and lead in these roles.

Clinical terminology roles can be found in a wide array of organizations, including healthcare delivery, pharmaceutical companies, clinical trial and research programs, EHR and clinical information system vendors, and health information exchanges—to name a few. In addition, there are standards organizations such as HL7 that require expertise in clinical terminology and vocabulary systems.

Organizations may employ individuals with titles or functions—such as clinical terminologist, clinical content terminology analyst/specialist, clinical data analyst, business analytics specialist, or clinical informatics specialist—who specialize in roles that include clinical terminologies. Responsibilities for these positions include (but are not limited to):

- Conduct research as needed to understand clinical concepts and terminologies
- Support discussions as the knowledge expert for terminologies and nomenclature and application for use throughout the organization
- Collaborate with medical and informatics teams to ensure accuracy of clinical information in technology platforms and materials
- Maintain and update existing terminologies within an organization, both locally and nationally
- Create and maintain mapping (for example, CPT to SNOMED CT and ICD-10 to SNOMED CT)
- Support implementation of HL7 standards regarding terminology use and implementation
- Provide industry expertise through consulting, analysis, and recommendations to assist in helping to create and maintain terminology and vocabulary standards
- Establish overall mapping guidelines and use cases for each assigned project
- Provide clinical terminology and clinical expertise support for customer inquiries
- Develop and maintain electronic clinical quality measure logic and value sets
- Develop terminology standards-based solutions from requirements, industry standards, and precedents
- Model and/or map clinical/business requirements using industry standard terminologies

Examples of clinical terminology roles are described below.

Terminology Asset Manager

A terminology asset manager:

- Ensures that clinical terminologies are utilized for their intended purposes and they are used correctly
- Ensures data is collected, stored, retrieved and communicated appropriately and in accordance with standards and regulations
- Combines knowledge of terminology, vocabulary, and classification systems with IG principles

Terminology Mapping Specialist

A terminology mapping specialist:

- Performs the key function in connectivity of healthcare systems, processes, and procedures
- Utilizes a source and a target to translate information into desired outcomes that are used in the previously mentioned areas, such as SNOMED CT, RxNorm, and LOINC

Consideration of data needs in the continuum of healthcare must be made—acute care to home care, rehab care, long-term care, behavioral healthcare, and other supporting entities such as vendors and regulatory agencies. Throughout this continuum, the HIM professional understands the myriad data sources necessary to create the map, the purpose and intent of the map, and desired outcomes. CMS allows for providers to report electronic clinical quality measures (eCQM) using a standard vocabulary as well as transitional vocabularies. A Home Management Plan of Care Document Given to Patient/Caregiver (CMS26v4) is an example of a hospital-based eCQM for pediatric patients discharged with a principal diagnosis of asthma. The asthma value set is an example where both SNOMED CT identifiers and ICD-10-CM codes are utilized in the diagnosis grouping value set for this metric. See [Appendix B](#) for a sample of this value set.

Terminology Educator/Trainer

A terminology educator/trainer:

- Serves as faculty for clinical terminology and vocabulary courses in academic programs
- Might be a guest speaker for academic programs
- Shares knowledge of clinical terminologies and vocabularies through presentations, certification preparation programs, and on-the-job training

Clinical terminologies are currently included in the CAHIIM curriculum requirements at the baccalaureate and master's degree levels of HIM education. See [Appendix C](#) for a list of the CAHIIM curriculum requirements.

Preparing for Clinical Terminology Roles

As the healthcare industry moves further away from paper records and expands into the use of electronic record-keeping systems, HIM professionals must stay cognizant of the need that this transition brings. To educate oneself in clinical terminology, a plethora of educational resources are available, including self-directed study, certifications, and higher education —colleges and universities that offer both undergraduate and graduate degrees. Recognizing the value of certifications, AHIMA has taken the lead in offering individuals the Certified Health Data Analyst (CHDA) and the Certified Professional in Health Informatics (CPHI) certificates.

AHIMA's online HIM Body of Knowledge houses numerous sources of information on data mapping and classifications, terminologies, and vocabularies, including articles and Practice Briefs. A search of the US National Library of Medicine National Institutes of Health (NIH/NLM) database of journal articles returns many results that discuss the HIM professional's role in data mapping and clinical classification and terminology systems.

Online courses in healthcare data design and mapping between one code system to another code system are provided by organizations such as the Global eHealth Collaborative (GeHCo). SNOMED International offers foundation, implementation, and content development theory virtual courses for its clinical terminology, and future courses are under consideration. The LOINC website offers several learning resources such as a quick start guide, a video introduction to LOINC, and a user's guide available for download, among others. [Appendix D](#) provides a sample list of other educational opportunities.

Postsecondary health information and informatics programs offer coursework that incorporates clinical classification systems, healthcare terminology and vocabularies, nomenclature, and standards. Such courses also highlight mapping concepts and relationships between clinical and administrative systems. Informatics offers an opportunity for health informatics professionals to work in teams with physicians, nurses, pharmacists, and other healthcare professionals to contribute to the development of standard terminologies.

HIM professionals interested in pursuing a clinical terminology role may also need to advance their skills in technology with data modeling, database systems management such as Oracle or SQL Server, data mining, mapping, and dictionaries, as well as statistical tools. Roles that focus on specific types of clinical terminologies, such as RxNorm or LOINC, require comprehensive understanding in the related clinical concepts of pharmacology or laboratory diagnostics.

The perceptive HIM professional should:

- Be cognizant and knowledgeable of new and emerging areas within healthcare, such as genomics, that will require clinical translation
- Analyze maps to ensure they are providing the outcome based on the use case appropriate to business and operational functions of the organization, managed care, health information exchange, etc.
- Recognize that data, databases, standards, and code sets are continuously updated; therefore, mapping must be maintained and updated—CPT, HCPCS, and ICD as well as SNOMED CT, LOINC, and RxNorm identifiers are updated and revised one or more times each year on different schedules
- Integrate (map) the data into a single system when a healthcare organization merges or combines a portion of operations

HIM professionals must be continuously thinking, planning, and strategizing in their career. The digital era is upon us and moving too fast to approach in a linear fashion. Utilizing professional organizations such as AHIMA, Massive Open Online Courses (MOOCs), and government programs, as well as mentors, HIM professionals have many options to add to their knowledge base and update their career skills. In addition, universities and local colleges are excellent resources.

Evolving to Meet the Demands of Changing Times

The transformation of healthcare through clinical practice, alternative care models, and quality and payment reforms, as well as the technology to support all these initiatives, continues to develop each year. The HIM profession has evolved over the years to meet the challenges and demands of the changing times. Now more than ever, the HIM profession is facing the same demand to identify the opportunities available and skills needed to meet the challenges facing healthcare today. With the myriad resources now available, including professional organizations such as AHIMA, the health information professional is uniquely positioned to benefit from as well as provide expertise within the rapidly changing healthcare environment.

Technological advances have made it easier to capture and store more data than ever before. But this comes with the more difficult task of ensuring that this data is just as easy to access, interpret, and transmit. The challenge is managing the clinical data content from different sources, systems, and environments, as well as representing this data in a way that is easily identified and understood by everyone. This is why clinical terminologies and classification systems were created. Two of AHIMA's strategic objectives revolve around informatics and information governance. Information is the key asset in both initiatives, and data is needed to create information. When a diabetic patient has his or her glucose tested, interpreting the result relies on knowing what type of test was done (finger stick, blood draw), under what circumstances (fasting or non-fasting), and the unit of measure. Assigning a LOINC code to the lab test standardizes the interpretation.

Whether entering the workforce for the first time or looking for growth opportunities, there are a variety of emerging positions that will require a clinical terminology background. This presents an exciting prospect for those in the HIM profession to advance both the profession and healthcare itself.

Notes

[1] AHIMA. "HIM Reimagined white paper." 2017.

[2] Giannangelo, Kathy. *Healthcare Code Sets, Clinical Terminologies, and Classification Systems,* Third Edition. Chicago, IL: AHIMA Press, 2015. p. 4.

[3] Vreeman, Daniel J. *LOINC Essentials*. eBook. 2017. p. 16.

References

Abrams, Kelly et al. "Learning More About Terminology Asset Management Trends, Principles, and Definitions." *Journal of AHIMA* 85, no. 2 (February 2014).

AHIMA. "Data Mapping and Its Impact on Data Integrity." 2013.

AHIMA. "Data Mapping Best Practices (2016 Update)." AHIMA Practice Brief. January 2016.

Alakrawi, Zahraa M. "Clinical Terminology and Clinical Classification Systems: A Critique Using AHIMA's Data Quality Management Model." Perspectives in Health Information Management (Summer 2016).

Bronnert, June et al. "Optimizing Data Representation Through the Use of SNOMED CT." Journal of AHIMA 85, no. 3 (March 2014): 48-50.

Cardillo, Elena. "Mapping between international medical terminologies." May 29, 2015.

Cimino, James J. "Desiderata for Controlled Medical Vocabularies in the Twenty-First Century." Methods of Information in Medicine 37, no. 4-5 (November 1998): 394-403.

Flores, Mary. "The Benefits Of Mapping CPT To LOINC." Health IT Outcomes. May 9, 2016.

Giannangelo, Kathy; Matthew Greene; Kathryn Perron; and Jane Cook. "Evolving Roles for the Clinical Terminology Manager." AHIMA 78th Annual Convention and Exhibit Proceedings, October 2006.

Health Level Seven. "Introducing HL7 FHIR."

IHTSDO. "SNOMED CT Starter Guide." 2016.

National Cancer Institute. "Index of Terminologies." NCI Wiki.

Oachs, Pamela and Amy Watters. Health Information Management, Concepts, Principles, and Practice, Fifth Edition. Chicago, IL: AHIMA Press, 2016.

Paterno, Marilyn D. et al. "Terms for Terms: A Terminology Guide for e-HIM Professionals." *Journal of AHIMA* 80, no. 1 (January 2009): 54-55, 58.

Tierney, Kate. "Medical Billing and Coding: Exciting Changes Ahead." 2016.

US Food and Drug Administration. "National Drug Code Directory."

White, Susan. A Practical Approach to Analyzing Healthcare Data, Second Edition. Chicago, IL: AHIMA Press, 2013. p. 15-39.

Wilson, Patricia S. "What Mapping and Modeling Means to the HIM Professional." *Perspectives in Health Information Management* (2007).

Appendix A: List of Clinical Terminologies (T), Vocabularies (V), and Classifications (C), with Links

T/V/C	Description

ABC Codes	Registered vocabulary of Health Level Seven (HL7), incorporated into the Unified Medical Language System (UMLS) in 1998. Created to describe the procedures, treatments, and services provided during an encounter with complementary and alternative medicine, nursing, and other integrative healthcare providers, with the intention to close the gaps in the HIPAA code set. https://abccodes.com/
CCC (Nursing)	Clinical Care Classification (CCC) consists of two interrelated taxonomies that are classified by care components, or clusters of elements, that represent behavioral, functional, physiological, or psychological care patterns. https://www.nlm.nih.gov/research/umls/sourcereleasedocs/current/CCC/
GMDN	Global Medical Device Nomenclature (GMDN), like the Universal Medical Device Nomenclature System, provides names, definitions, and unique codes for essentially all medical devices and supplies at the generic device group level. www.gmdnagency.org/
ICF	The International Classification of Functioning, Disability and Health (ICF) is designed to capture the holistic and systemic perspective of functioning and disability. www.who.int/classifications/icf/icf_more/en/
ICNP	The International Classification for Nursing Practice (ICNP) is a unified nursing language system. www.icn.ch/what-we-do/international-classification-for-nursing-practice-icnpr/
ICPC	The International Classification of Primary Care (ICPC) is used to classify patient data related to general and family practice and primary care. www.who.int/classifications/icd/adaptations/icpc2/en/
LOINC	Logical Observation Identifiers, Names, and Codes (LOINC) is a medical informatics standard to facilitate the exchange and pooling of laboratory results. https://loinc.org/
MEDCIN	MEDCIN is a proprietary clinical terminology developed as a point-of-care tool for electronic medical record documentation at the time and place of patient care. MEDCIN was developed by Peter S. Goltra, founder of Medicomp Systems Inc. www.medicomp.com/
MedDRA	The Medical Dictionary for Regulatory Activities (MedDRA) is a tool used by pharmaceutical companies in reporting adverse effects and potential adverse effects of medications and other products. www.meddra.org/
NANDA (Nursing)	The North American Nursing Diagnosis Association's (NANDA's) Nursing Diagnoses: Definitions and Classification is a set of nursing diagnoses adopted by the organization. The system describes patients' reactions to diseases rather than classifying the conditions of diseases and disorders. www.nanda.org/
NDF-RT	The National Drug File - Reference Terminology (NDF-RT) was created for the Veterans Health Administration National Drug File (VANDF), a centrally maintained electronic formulary used by every Veterans Administration (VA) medical center nationwide. www.nlm.nih.gov/research/umls/sourcereleasedocs/current/NDFRT/
NIC (Nursing)	The Nursing Interventions Classification (NIC) is a standard classification of interventions that nurses do on behalf of patients in all care domains. www.nlm.nih.gov/research/umls/sourcereleasedocs/current/NIC/
NOC (Nursing)	The Nursing Outcomes Classification (NOC) is a standardized classification of outcomes developed for use in all settings with all patient populations. www.nlm.nih.gov/research/umls/sourcereleasedocs/current/NOC/
Omaha System (Nursing)	The Omaha System is a comprehensive practice and documentation tool used by nurses, other healthcare providers, and students. www.omahasystem.org/
PNDS	The Perioperative Nursing Data Set (PNDS) is designed to capture activities of operating room nurses. www.nlm.nih.gov/research/umls/sourcereleasedocs/current/PNDS/
RxNorm	RxNorm is a nonproprietary standardized nomenclature for clinical drugs. www.nlm.nih.gov/research/umls/rxnorm/overview.html
SNODENT	The Systematized Nomenclature of Dentistry (SNODENT) was developed to provide dentistry with a comprehensive terminology to be used to establish and define dental and oral disease classifications and comorbidities. www.ada.org/en/member-center/member-benefits/practice-resources/dental-informatics/snodent
SNOMED CT	The Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) is a controlled terminology with comprehensive coverage of diseases, clinical findings, etiologies, and procedures and outcomes.

	www.snomed.org/snomed-ct
UMDNS	The Universal Medical Device Nomenclature System (UMDNS) is a proprietary, standardized controlled international nomenclature and computer coding system for medical devices and materials, clinical laboratory equipment and in vitro diagnostics, disposables and supplies, selected hospital furniture, casework and system, and instruments used to test clinical equipment. www.ecri.org/components/UMDNS/Pages/default.aspx

Source: Giannangelo, Kathy. *Healthcare Code Sets, Clinical Terminologies, and Classification Systems, Third Edition*. Chicago, IL: AHIMA Press, 2015.

Editor's Note: All website URLs are current as of May 15, 2017.

Appendix B: Sample from Asthma Diagnosis Grouping Value Set for Home Management Plan of Care Measure

Code	Code Description	Code System
426979002	Mild persistent asthma (disorder)	SNOMEDCT
427679007	Mild intermittent asthma (disorder)	SNOMEDCT
707445000	Exacerbation of mild persistent asthma (disorder)	SNOMEDCT
707511009	Uncomplicated mild persistent asthma (disorder)	SNOMEDCT
707981009	Acute severe exacerbation of mild persistent asthma (disorder)	SNOMEDCT
J45.20	Mild intermittent asthma, uncomplicated	ICD10CM
J45.21	Mild intermittent asthma with (acute) exacerbation	ICD10CM
J45.22	Mild intermittent asthma with status asthmaticus	ICD10CM
J45.30	Mild persistent asthma, uncomplicated	ICD10CM
J45.31	Mild persistent asthma with (acute) exacerbation	ICD10CM
J45.32	Mild persistent asthma with status asthmaticus	ICD10CM

Appendix C: CAHIIM Curriculum Requirements

Associate's Degree	Baccalaureate Degree	Master's Degree
Domain I, Data Content, Structure and Standards	Domain I, Data Content, Structure and Standards (Information Governance)	Domain I, Data Content, Structure and Standards (Information Governance)
Subdomain 1.A - Classification Systems	Subdomain 1.A - Classification Systems	Subdomain 1.A - Classification Systems
Subdomain 1.A.1 - Apply diagnosis/procedure codes according to current guidelines	Subdomain 1.A.2 - Identify the functions and relationships between healthcare classification systems	Subdomain I.A.1 - Interpret terminologies, vocabularies, and classification systems
	Subdomain I.A.3 - Map terminologies, vocabularies and classification systems	Subdomain 1.A.2 - Construct examples of mapping of clinical vocabularies and terminologies to appropriate classification systems
Subdomain 1.C - Information Governance	Subdomain 1.C - Information Governance	Subdomain 1.C - Information Governance
Subdomain 1.C.1 - Apply policies and procedures to ensure the accuracy and	Subdomain 1.C.1 - Format data to satisfy integration needs	Subdomain 1.C.1 - Evaluate data integration needs

integrity of health data			
	Subdomain 1.C.2 - Construct and maintain the standardization of data dictionaries to meet the needs of the enterprise	Subdomain 1.C.2 - Propose data interoperability and sharing policies, structures, and methods	
		Subdomain 1.C.3 - Recommend data standard policies for interoperability and sharing	
Source: Commission on Accreditation for Health Informatics and Information Management Education. "Curriculum Requirements."			

Appendix D: Sample Educational Opportunities

Organization	Title	Brief Description	Link*	Fees
Global eHealth Collaborative (GeHCo)	Mapping Terminology and Classification	This course explains the opportunities and risks inherent in the mapping process and discusses the issues that need to be considered in the development, maintenance, and use of mapping in healthcare. You will learn to identify the variations in process, precision, and administration required for mapping for different purposes and in different environments. The course is based upon the ISO Technical Report 12300 Mapping of Terminologies to Classifications.	Website	Yes
SNOMED International	SNOMED CT E-Learning Courses	Offers three online, self-paced courses. 1. SNOMED CT Foundation Course provides a basic knowledge of SNOMED CT 2. SNOMED CT Implementation Course provides information for those involved in deployment decision making for SNOMED CT 3. SNOMED CT Content Development Theory Course leads participants in the content authoring, extension management, and mapping for the terminology	Website	No
LOINC	Various	The website lists multiple learning opportunities including getting started, introduction, presentations, recommended readings, and meetings, workshops and webinars. LOINC Essentials is a guide to assist in mapping local codes to LOINC.	Website	$39 for PDF copy of guide
RxNorm	Understanding RxNorm	This is a webinar on RxNorm, discussing basic concepts and its role in interoperability (Clinical Architecture).	Website	No
N/A	MOOC	Massive open online courses are available from many educational institutions as well as commercial organizations.	Website	No
University of Victoria, Canada	Graduate Certificate in Health Terminology Standards	A one-year part-time program consisting of courses on health information, controlled terminology, and HIE standards, culminating in a field project.	Website	Yes

*All links verified as of June 22, 2017

Appendix E: Sample Position Description Excerpts

Sample 1: Clinical Informatics Specialist

Functions

- Provide terminology and industry expertise to help create and maintain terminology standards to internal product efforts as well as external clients
- Assist with research to identify opportunities for new content and product development
- Work with content team analysts to help design and manage a variety of internal and external terminology-related projects
- Conduct discovery and requirements gathering efforts in conjunction with other teams to identify issues and opportunities throughout hospital, healthcare, and payer organizations

Qualifications

- Solid healthcare terminology experience with standards, such as but not limited to SNOMED, LOINC, ICD-10, HL7, and pharmacy
- Expertise with healthcare business processes and associated clinical and/or payer application software
- Proficiency in Excel, PowerPoint, MS Office, SQL Queries
- Strong organizational skills and the ability to work independently
- Strong written, verbal, and interpersonal communication skills
- Actual clinical practice such as medical or nursing experience, preferred

Sample 2: Clinical Content Analyst

Functions

- Use proprietary tools to analyze and review clinical information
- Conduct research as needed to understand clinical concepts and terminologies
- Develop proprietary clinical content following procedures and best practices adopted by team
- Assist with research to identify opportunities for new/improved content and product development
- Design processes and quality control programs around the creation and production of clinical content, including refresh processes to ensure all content is up-to-date and appropriately documented
- Collaborate with medical and informatics teams to ensure accuracy of clinical information in technology platforms and materials
- Support client and internal discussions as the knowledge expert for terminologies and nomenclature and how those are applied

Qualifications

- Understanding of and familiarity with healthcare data management, clinical informatics, and/or data analysis
- Strong knowledge of anatomy and physiology
- Strong knowledge of patient care in a clinical setting
- Technical minded with an aptitude for abstraction, data modeling, pattern matching, puzzle solving, and applying logic
- A demonstrated high level of autonomy, initiative, resourcefulness, organization, and attention to detail
- Knowledge of clinical/medical terminology, and coding systems (i.e., ICD-9, ICD-10, CPT, SNOMED, LOINC, RxNORM etc.) and data exchange standards (i.e, HL7/FHIR)
- Familiarity with creating, curating, and/or mapping between standard and proprietary terminologies
- Familiarity with design, creation, or usage of clinical decision support rules/systems or clinical analytics
- Breadth of knowledge across medical specialties
- Familiar with SQL

Sample 3: Audit Analyst

Functions

- Participation in Big Data analytics/data analysis/business intelligence projects
- Participation in continuous auditing projects
- Departmental reporting and administration of departmental applications

Qualifications

A broad cross section of relevant professional experiences, knowledge, and skills as typically acquired in three to seven years of professional work experience, preferably in the healthcare industry. This may include, but is not limited to:

- Data modeling, relational database design, and design and development of data structures including metadata
- Tools and techniques for obtaining, analyzing, and working with diverse, disparate, large, and complex sets of structured, unstructured, and semi-structured data from a variety of information systems
- Tools and techniques for performing data mapping/design, data mining, data conversion, data integration, descriptive statistics, exploratory data analysis, confirmatory data analysis, text analytics, predictive analytics, and prescriptive analytics
- Developing and maintaining automated and reusable routines/scripts, using SQL, ODBC, ACL, or other similar technologies
- Data visualization techniques and other communication methods to convey the results of data analytics/data analysis activities and other usable intelligence synthesized from diverse and complex information sets
- Commitment to detail and accuracy of work product; experience performing quality control testing and review to ensure quality, completeness, and accuracy of reports/deliverables
- Expert user of MS Windows and MS Office products (i.e., Word, Excel, Access, Outlook, Visio, PowerPoint)
- Knowledge of the use of Add-ins, Macros, and different security levels/mechanisms
- Demonstrated ability to establish and maintain effective working relationships within teams and across the enterprise
- Written and oral interpersonal communication skills, including strong collaboration skills
- Problem solving and conflict/issue management and resolution skills
- Project management tools and techniques
- Proven ability to learn new applications/software systems effectively and efficiently
- Proven ability to understand business processes and interact directly with internal customers and peers to provide sound business solutions
- Proven ability to work independently and as part of a team

Additionally, the following are highly desirable:

- Knowledge of the healthcare industry and the business operations of an integrated delivery network, including familiarity with the various types/sources of healthcare data, including medical and pharmacy claims, coding and billing, reimbursement, finance, and human resource data
- Experience with the one or more electronic health record systems
- Experience successfully operating in a matrix management environment or in a consultant role

Sample 4: Clinical Data Coordinator

Functions

- Perform coding of clinical data of applicable panels for phase I-IV trials as per SOP, protocol, and study-specific guidelines
- Involved with executing coding activities to support in stream data entry, data review, and database closure
- Analyze and evaluate clinical data terminology (medical history verbatim, adverse experiences, and/or concomitant medications) for coding purposes
- Recognize and initiate resolution of data inconsistencies with subsequent follow-up until satisfactory resolution
- Ensure medical accuracy, consistency, and integrity of the dictionary system by concise coding thorough term/drug research and definition

- Create/maintain ad-hoc computer procedures utilized in generating subset dictionary listings for sponsor review and approval
- Demonstrate initiative and ability to work under pressure to organize work requests and set priorities as defined by sponsor-driven project milestone deadlines
- Write coding SOPs and study specific guidelines
- Maintain clinical data management SOPs
- Serve as clinical data management contact for coding-related questions and/or query resolutions
- Sponsor contact for study related questions and/or query resolutions
- Interact with various data management and other functional area colleagues, including but not limited to: Biostatistics and Programming, Clinical, Project Management, Safety, site personnel, etc.
- Provide assistance, mentoring, and/or training to clinical data management staff such as clinical data coordinators and/or data entry staff, as necessary

Qualifications

- Knowledge of medical terminology with emphasis on anatomy and physiology
- Demonstrate knowledge of the clinical trial process
- Demonstrate knowledge of the data management process
- Knowledge of drug development process
- Ability to think critically and use good problem solving skills
- Attention to detail
- Strong organizational and time management skills
- Excellent verbal and written communications skills
- Knowledge of the MedDRA and WHODrug classification dictionaries
- Knowledge of ClinTrial, SQL, MS Word, Excel, PowerPoint

Sample 5: Terminology Analyst

Functions

- Maps/matches/links between medical concepts and relevant terminology/classification standards consistent with external rules and conventions utilizing the appropriate tooling and workflow
- Creating and maintaining mapping/matching/linking guidance documents
- Content quality/integrity from a mapping/matching/linking perspective
- Contributing to internal discussions as the mapping/matching/linking knowledge expert for terminology/classification standards and their applications
- Supporting user community questions by offering mapping/matching/linking expertise to ensure accurate implementation
- Evaluating informatics and technical requirements for continuous improvement to the design and content of the mapping tool
- Testing and providing feedback on tools as first-level users in order to advise the technical development team on issues affecting delivery of mapping content

Qualifications

- Knowledge of medical terminology, anatomy, and physiology
- Database management including data manipulation and analysis (i.e., using Microsoft Access or SQL)
- Attention to detail
- Excellent written and verbal communication skills
- Experience working with terminologies is an asset

Sample Position Description Glossary

Term	Definition

Data Mapping	Allows for data initially captured for one purpose to be translated and used for another purpose.
Data Modeling	Process of determining the user's information needs and identifying relationships about the data.
eCQM	Electronic Clinical Quality Measure, established to measure outcomes for many common disease conditions.
FHIR	Fast Healthcare Interoperability Resources, a standard for exchanging health information electronically. It allows for simultaneous access from different healthcare systems.
Heuristics	Rules for map development
HL7	Health Level Seven, an international organization of health professionals dedicated to creating standards for the exchange, management, and integration of electronic information. It is also the name of the messaging standard for the exchange of health information.
Semantic Interoperability	The ability to exchange data and information with its original meaning intact and understood by all receivers.
Standard Vocabulary	Vocabulary or terminology identified in EHR standards for the content exchanged among information systems, such as SNOMED CT, LOINC, and RxNorm.
Transitional Vocabulary	Vocabulary or terminology identified by the Health IT Standards Committee (HITSC) as acceptable during the transition period before the standard vocabulary becomes fully adopted.

References

AHIMA. *Pocket Glossary of Health Information Management and Technology*. Chicago, IL: AHIMA Press, 2010.

Amatayakul, Margret. *Health IT and EHRs: Principles and Practice, Sixth edition*. Chicago, IL: AHIMA Press, 2017, p. 662.

Biedermann, Sue and Diane Dolezal. *Introduction to Healthcare Informatics, Second edition*. Chicago, IL: AHIMA Press, 2017.

Health Level Seven. "FHIR Overview."

Lead Author

Linda Hyde, RHIA

Prepared By

Anne Casto, RHIA, CCS
Melissa Koehler, RHIT, CHDA, CDIP, CCS, CCS-P
Famey Lockwood, RN, MSHI, CHDA, CCS, CCS-P
Kathleen Peterson, MS, RHIA, CPHI, CCS

Acknowledgements

Sue Bowman, MJ, RHIA, CCS, FAHIMA
June Bronnert, RHIA, CCS, CCS-P
Suzanne P. Drake, RHIT, CCS
Melanie Endicott, MBA/HCM, RHIA, CDIP, CHDA, CCS, CCS-P, FAHIMA
Kathy Giannangelo, MA, RHIA, CCS, CPHIMS, FAHIMA
Lesley Kadlec, MA, RHIA, CHDA
Patricia Maccariella Hafey, RHIA, CDIP, CCS, CCS-P, CIRCC

Anna Orlova, PhD
Susan Perkins, RHIT, CCS, CHTS-IM
Mari Pirie-St. Pierre, RHIA
Donna J. Rugg, RHIT, CDIP, CCS
Lisa L. Withers, RHIA, CCS
Holly Woemmel, MA, RHIA, CHPS

Article citation:
Hyde, Lynda; Casto, Anne B.; Koehler, Melissa; Peterson, Kathleen. "Clinical Terminology: Expanding Career Pathways for HIM Professionals - Retired" *Journal of AHIMA* 88, no.9 (September 2017): 50-55 [expanded online version].

Driving the Power of Knowledge

Anna Orlova, PhD
Susan Perkins, RHIT, CCS, CHTS-IM
Mari Pirie-St. Pierre, RHIA
Donna J. Rugg, RHIT, CDIP, CCS
Lisa L. Withers, RHIA, CCS
Holly Woemmel, MA, RHIA, CHPS