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Introduction to Medical Coding, Introductory Module

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Abstract

In our increasingly global economy, manufacturers and distributers sending and receiving goods are frustrated by the reality of multiple languages. As an example of corporate coding, proactive management in an automotive company have invented a coding system where each car type has its own identification code with associated words that describe the product. Therefore, they can be confident that anyone referring to ID 4523 is describing a four-door vehicle... **Read More**

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2019 Introduction to Medical Coding

Objectives of this learning module:

1. Learners will be able to identify the legal implications of and ramifications of incorrect coding and the rules to follow for compliance and protection.
2. Learners will examine the structure of modern healthcare coding systems.
3. Learners will become familiar with field resources available for coders.

Introduction

In our increasingly global economy, manufacturers and distributers sending and receiving goods are frustrated by the reality of multiple languages. As an example of corporate coding, proactive management in an automotive company have invented a coding system where each car type has its own identification code with associated words that describe the product. Therefore, they can be confident that anyone referring to ID 4523 is describing a four-door vehicle (4000 level), compact vehicle (500), black color (20) with leather interior (3). This example is analogous to clinical or medical coding.

Clinical or medical coding is an administrative process to transform medical record documents such as laboratory and radiologic results and physician notes into universal alphanumeric codes that represents the medical diagnosis, procedure, service, or equipment. While digital medical records allow entry of narrative text, such as comments and notes, this type of data entry is inefficient for examining larger data patterns that lead to discovery and for communicating medical record information to various stakeholders, including reimbursement agents. Digital data is typically coded by form entry or selection of a code from a predetermined list. Since a single medical event may generate a complex treatment, standardization of procedures, treatments, and medical devices allows for representation of a clinical concept such as chest pain or heart disease. Therefore, clinical coding relates to medical events and ongoing conditions by describing underlying concepts and identifying interventions to allow processing within an information system. While software is becoming increasingly available for converting free or delimited text and codes into more complex coded terms, inaccuracy and quality are still consistent concerns. Ideally, coding provides a level of detail that allows a stakeholder to understand a patient's condition and how treatment relates to that condition.

While a perception exists that the primary purpose of medical coding is for reimbursement claims (Pohontsch, et al., 2018), in fact there are numerous benefits to deploying a coding system. In addition to providing a robust reimbursement mechanism for hospitals and healthcare providers to receive payments for services with less than 1% of claims rejected due to coding issues (Landi, 2015), coded insurance claims serve as avenue to discover fraud and insurance abuse and allow for oversight and auditing processes. Coding allows for accurate documentation of a patient's conditions which can lead to better medical decision making, even in cases where a

condition is complex or multiple conditions present. In addition to coding a patient's chief complaint, secondary codes allow the history of a current complaint and related medical history, which can extend to family history, to help illustrate the condition. Finally, standardized coding fosters clinical classification of morbidity and mortality for statistical purposes and determining patterns of research variables. In other words, clinical classification is a structure that dealing with pathological states such as indexing of hospital records for improved causation, linkages, and risk management. For stakeholders in healthcare, claims and payments can be analyzed to determine frequency, averages, and patterns of services and care trends. In addition, coded procedures provide data points for quantitative measurement of quality, safety, and efficacy of care. Therefore, users and purposes of coded data vary widely from individual and local concerns to larger healthcare delivery design and policy framing issues.

Clinical coding systems, also known as vocabularies or terminologies, are structured, and sometimes, hierarchical lists of medical terms which can be used to describe patient procedures, conditions, diseases, findings, and treatment solutions. Augmented by a physical examination, diagnostic results, medical notes, and prognosis, clinical coding staff are instrumentational in patient healthcare management processes, risk reduction for the healthcare setting, and population data processes. Therefore, coding systems are a mechanism to record a clinical event in a way that can be easily accessed, retrieved, organized, sorted, analyzed, filtered, and transmitted.

Structure of a Coding System

When sponsoring organizations create coding systems, they can take one of two approaches: as a *classification system* or as a *terminology system*. Classifications systems use a meaning-based approach and reflect a defined area or domain, coding specific data items like procedures, pharmacy activity, lab reports, and diagnoses. Therefore, classification systems perform well in statistical analysis, epidemiological studies, and administrative use. The World Health Organization's (WHO) International Classification of Disease (ICD) (https://www.who.int/classifications/icd/revision/en/) serves as an international leader in classifications with multiple applications and national or linguistic derivatives. In 2015, the medical community ran out of codes in the International Classification of Diseases (ICD) system they were using at the time, ICD-9, forcing a switch to ICD-10, a code update that transitioned 19,000 codes to a set of 142,000 (MBA Medical, 2015). In response, American federal health and healthcare agencies mandated adoption of the current ICD standard; ICD-10 (National Center for Health Statistics, n.d.) in 2015. ICD-11 is in international development with a beta version available as of 2018 (https://icd.who.int/) and will be described in a later module. Terminology systems use a concept approach to organize labels within a domain and are often used as a common reference system to map between systems. These systems perform well in predictive analytics and global studies. In terminology systems, concepts can be combined to make complex *nomenclatures*, or naming systems. SNOWMED CT (www.snomed.org),

produced by an international, non-profit standards development organization, is a recognized leader due to its multilingual translations and wealth of research validations.

While a number of healthcare coding systems have been developed, they tend to compete due to need, design, and field adoption factors and as a group, hinder standardization. While wide-scale implementation of a coding systems favors government-adopted systems, such as ICD, such systems often do not have the level of granular detail needed to support specific clinical needs causing information to be lost. On the flip side, highly detailed coding systems hinder data transfer between systems, known as interoperability due to difficulty in reconciling structure and cross-mapping between vocabulary and definitions.

Example: for coding a broken leg
ICD-10-CM Diagnosis code S82.92XA is used for an unspecified fracture of the left lower leg
SNOWMED CT deploys 414292006 for fracture of the lower leg

However, coders must use medical records to research the following details to correctly assign a code and some options have more than 150 associated codes:

- The associated visit is an initial or subsequent visit
- The specific bones of which leg were injured
- Is the fracture open or closed
- Is the fracture is traumatic or pathologic
- Is the fracture was displaced

ICD-10

Based on Modification of World Health Organization (WHO) ICD-9 (1979), revision to that code began in 1983 with Volume 1 (a tabular list) published in 1992, Volume 2 (an instruction manual) published in 1993, and Volume 3 (an alphabetic index) published in 1994. ICD-10's most significant modification over previous version ICD-9 was the replacement of an alphanumeric structure over the numerical base, plus the inclusion of an additional two characters to handle additional coding needs. The WHO (WHO, 2004) justifies that ICD-10 changes were needed to directly link morbidity purposes to research and reimbursement and other researchers are examining billing code systems for their: coding accuracy (Nuraei, et al., 2015) and validity in reflecting morbidity (Sigakis, et al., 2016).

ICD-9 Code structure	ICD-10 Code structure
###.##	###.####
Category.Modifier	Group, Category.Sub-Category,Modifier, Extension

Procedure Coding System vs. Clinical Modification System

Used in hospital and inpatient settings, ICD-10 is required in all Health Insurance Portability and Accountability Act (HIPAA) transactions. ICD-10-CM (Clinical Modification System) is the most recent version used in clinical and outpatient settings in the United States. ICD-10-PCS (Procedure Coding System) is used in hospital and inpatient settings and has a seven character alphanumeric code structure consisting of numeric digits 0- 9 and 24 letters A-H,J-N and P-Z, omitting O and I to prevent confusion with the digits 0 and 1; therefore, individual digits have a potential for up to 34 possible values, although each of those is limited by standing values. In the United States, the Centers for Medicare and Medicad Services provides updated tables and indexes at https://www.cms.gov/Medicare/Coding/ICD10/2019-ICD-10-CM.html and https://www.cms.gov/Medicare/Coding/ICD10/2019-ICD-10-PCS.html.

Substance	Poisoning Accidental (unintentional)	Poisoning Intentional self-harm	Poisoning Assault	Poisoning Undetermined	Adverse effect	Underdosing
ABOB	T37.5X1	T37.5X2	T37.5X3	T37.5X1	T37.5X5	T37.5X6
Abrine	T62.2X1	T62.2X2	T62.2X3	T62.2X4	--	--
Abrus (seed)	T62.2X1	T62.2X2	T62.2X3	T62.2X1	--	--
Absinthe	T51.0X1	T51.0X2	T51.0X3	T51.0X4	--	--
- beverage	T51.0X1	T51.0X2	T51.0X3	T51.0X4	--	--
Acaricide	T60.8X1	T60.8X2	T60.8X3	T60.8X4	--	--
Acebutolol	T44.7X1	T44.7X2	T44.7X3	T44.7X4	T44.7X5	T44.7X6
Acecarbromal	T42.6X1	T42.6X2	T42.6X3	T42.6X4	T42.6X5	T42.6X6
Aceclidine	T44.1X1	T44.1X2	T44.1X3	T44.1X4	T44.1X5	T44.1X6
Acedapsone	T37.0X1	T37.0X2	T37.0X3	T37.0X1	T37.0X5	T37.0X6
Acefylline piperazine	T48.6X1	T48.6X2	T48.6X3	T48.6X4	T48.6X5	T48.6X6
Acemorphan	T40.2X1	T40.2X2	T40.2X3	T40.2X1	T40.2X5	T40.2X6
Acenocoumarin	T45.511	T45.512	T45.513	T45.514	T45.515	T45.516
Acenocoumarol	T45.511	T45.512	T45.513	T45.514	T45.515	T45.516
Acepifylline	T48.6X1	T48.6X2	T48.6X3	T48.6X4	T48.6X5	T48.6X6
Acepromazine	T43.3X1	T43.3X2	T43.3X3	T43.3X4	T43.3X5	T43.3X6
Acesulfamethoxypyridazine	T37.0X1	T37.0X2	T37.0X3	T37.0X1	T37.0X5	T37.0X6
Acetal	T52.8X1	T52.8X2	T52.8X3	T52.8X4	--	--
Acetaldehyde (vapor)	T62.8X1	T62.8X2	T52.8X3	T62.8X4	--	--
- liquid	T65.891	T65.892	T65.893	T65.894	--	--
P-Acetamidophenol	T39.1X1	T39.1X2	T39.1X3	T39.1X1	T39.1X5	T39.1X6
Acetaminophen	T39.1X1	T39.1X2	T39.1X3	T39.1X4	T39.1X5	T39.1X6
Acetaminosalol	T39.1X1	T39.1X2	T39.1X3	T39.1X4	T39.1X5	T39.1X6
Acetanilide	T39.1X1	T39.1X2	T39.1X3	T39.1X4	T39.1X5	T39.1X6
Acetarsol	T37.3X1	T37.3X2	T37.3X3	T37.3X4	T37.3X5	T37.3X6
Acetazolamide	T50.2X1	T50.2X2	T50.2X3	T50.2X1	T50.2X5	T50.2X6
Acetiamine	T45.2X1	T45.2X2	T45.2X3	T45.2X4	T45.2X5	T45.2X6
Acetic						
- acid	T54.2X1	T54.2X2	T54.2X3	T54.2X4	--	--
-- with sodium acetate ointment	T49.3X1	T49.3X2	T49.3X3	T49.3X4	T49.3X5	T49.3X6
-- ester (solvent)(vapor)	T52.8X1	T52.8X2	T52.8X3	T52.8X4	--	--
-- irrigating solution	T50.3X1	T50.3X2	T50.3X3	T50.3X4	T50.3X5	T50.3X6
-- medicinal (lotion)	T49.2X1	T49.2X2	T49.2X3	T49.2X4	T49.2X5	T49.2X6
- anhydride	T65.891	T65.892	T65.893	T65.894	--	--
- ether (vapor)	T52.8X1	T52.8X2	T52.8X3	T52.8X4		
Acetohexamide	T38.3X1	T38.3X2	T38.3X3	T38.3X4	T38.3X5	T38.3X6
Acetohydroxamic acid	T50.991	T50.992	T50.993	T50.994	T50.995	T50.996
Acetomenaphthone	T45.7X1	T45.7X2	T45.7X3	T45.7X4	T45.7X5	T45.7X6
Acetomorphine	T40.1X1	T40.1X2	T40.1X3	T40.1X4	--	--
Acetone (oils)	T52.4X1	T52.4X2	T52.4X3	T52.4X4	--	--
- chlorinated	T52.4X1	T52.4X2	T52.4X3	T52.4X4	--	--
- vapor	T52.4X1	T52.4X2	T52.4X3	T52.4X1		
Acetonitrile	T52.8X1	T52.8X2	T52.8X3	T52.8X4	--	--
Acetophenazine	T43.3X1	T43.3X2	T43.3X3	T43.3X1	T43.3X5	T43.3X6
Acetophenetidin	T39.1X1	T39.1X2	T39.1X3	T39.1X4	T39.1X5	T39.1X6

Screenshot of the 2019 ICD-10 CM Drug Table available from the Centers for Medicaid and Medicare

The first three values of the code (e.g., 027) comprises the index which refers to a hierarchical alphabetic lookup. The first value of the index refers to one of seventeen sections of medical practice such as Mental Health, Chiropractic, Obstetrics, etc. Averill, et al. (2016) note that medical and surgical section codes are most prevalent in inpatient settings. The second digit specifies the body system, while the third specifies the root operation or objective of the procedure performed. Based upon the index, a corresponding table is then used to obtain the complete code by specifying the last four values. The fourth digit specifies the specific body part on which the procedure was performed and the fifth character indicates the approach used to reach the procedure site. The sixth digit indicates whether any device was deployed for the procedure. The seventh character is a qualifier that may have a specific meaning for a limited range of values. For example, the qualifier can be used to identify the destination site of the root operation. Averill, et al. (2016) notes that the first through fifth digit locations are always assigned a specific value, but the device (sixth character) and the qualifier (seventh character) are not applicable to all procedures which in that case would be assigned the value Z. In their FAQs guide to ICD-10, the Centers for Medicare and Medicad Services (2016) provides the following example for the *family* of codes under Hodgkin's lymphoma (code C81):

C81.00 Nodular lymphocyte predominant Hodgkin lymphoma, unspecified site
C81.03 Nodular lymphocyte predominant Hodgkin lymphoma, intra-abdominal lymph nodes
C81.10 Nodular sclerosis classical Hodgkin lymphoma, unspecified site
C81.90 Hodgkin lymphoma, unspecified, unspecified site

The guide also describes a family of codes as clinically related in order to provide specific informational differences in regard to the condition, such as type of condition and specific locality of the presentation.

Chapter 1

Certain infectious and parasitic diseases (A00-B99)

Includes: diseases generally recognized as communicable or transmissible

Use additional code to identify resistance to antimicrobial drugs (Z16.-)

Excludes1: certain localized infections - see body system-related chapters

Excludes2: carrier or suspected carrier of infectious disease (Z22.-)
infectious and parasitic diseases complicating pregnancy, childbirth and the puerperium (O98.-)
infectious and parasitic diseases specific to the perinatal period (P35-P39)
influenza and other acute respiratory infections (J00-J22)

This chapter contains the following blocks:
A00-A09   Intestinal infectious diseases
A15-A19   Tuberculosis
A20-A28   Certain zoonotic bacterial diseases
A30-A49   Other bacterial diseases
A50-A64   Infections with a predominantly sexual mode of transmission
A65-A69   Other spirochetal diseases
A70-A74   Other diseases caused by chlamydiae
A75-A79   Rickettsioses
A80-A89   Viral and prion infections of the central nervous system
A90-A99   Arthropod-borne viral fevers and viral hemorrhagic fevers
B00-B09   Viral infections characterized by skin and mucous membrane lesions
B10   Other human herpesviruses
B15-B19   Viral hepatitis
B20   Human immunodeficiency virus [HIV] disease
B25-B34   Other viral diseases
B35-B49   Mycoses
B50-B64   Protozoal diseases
B65-B83   Helminthiases
B85-B89   Pediculosis, acariasis and other infestations
B90-B94   Sequelae of infectious and parasitic diseases
B95-B97   Bacterial and viral infectious agents
B99   Other infectious diseases

Intestinal infectious diseases (A00-A09)

A00 Cholera

   A00.0 Cholera due to Vibrio cholerae 01, biovar cholerae
          Classical cholera

   A00.1 Cholera due to Vibrio cholerae 01, biovar eltor
          Cholera eltor

   A00.9 Cholera, unspecified

A01 Typhoid and paratyphoid fevers

   A01.0 Typhoid fever
          infection due to Salmonella typhi

Screenshot of Tabular list of Chapter 1 of the 2019 ICD-10-CM Table available from the Centers for Medicaid and Medicare

In general, the overall structure of the ICD-10 coding system addresses epidemic diseases first, followed by constitutional or general diseases with local diseases, arranged by site. Developmental diseases and injuries conclude the coding system in 21 chapters. ICD-10 deploys several conventions such as instructional terms and notes, inclusion and exclusion terms, qualifiers, lead and relational terms, abbreviations, punctuation marks and symbols meant to further instruct users, although these conventions have been the subject of some disagreement with critics noting inconsistent guidance (Australian Department of Health & Human Services, 2010).

Updated changes to ICD-10 includes restrictions on umbrella options such as "Not otherwise specified", segregation of diagnostic information from procedure descriptions, use of combination codes, drug-induced conditions and post-procedural disorders, and expansion and elimination of specific codes.

Student Practice: Locating a code

Go to https://www.cms.gov/Medicare/Coding/ICD10/2019-ICD-10-CM.html

Screenshot of CMS.gov 2019 ICD-10-CM webpage, January 2019

Download all six (6) files. Your operating system may automatically unzip the files and deliver you to a window view of the first file. Open the 2019 Code Tables and open the ICD-10 CM Index. Let's locate a term in Alphabetic index: Abscess of the large intestine with bleeding. We should get the code K57.21. Then, verify code in Tabular List and follow all notes and cross-references. Make sure to code to the highest level of specificity (including laterality) for best results.

Reference classifications:

- International Statistical Classification of Diseases and Related Health Problems (ICD)
  - ICD-10 (10th revision, in use by WHO since 1994)
    - ICD-10-CM (Clinical Modification, used in the US since October 2015)
- International Classification of Functioning, Disability and Health (ICF)

Derived classifications – use a similar structure to WHO Reference Classifications in order to address issues of a specific field:

- International Classification of Diseases for Oncology, Third Edition (ICD-O-3)
- ICD-10 Classification of Mental and Behavioral Disorders (Chapter V of ICD-10)
- Application of the International Classification of Diseases to Dentistry and Stomatology, 3rd Edition (ICD-D)
- Application of the International Classification of Diseases to Neurology (ICD-10-NA)

Related classifications – again, using WHO Reference structure, but instead of being field-based, these classifications extend applications:

- International Classification of Primary Care (ICPC)
  - ICPC-2 PLUS
- International Classification of External Causes of Injury (ICECI)
- Anatomical Therapeutic Chemical Classification System with Defined Daily Doses (ATC/DDD)
- Technical aids for persons with disabilities: Classification and terminology (ISO9999)
- International Classification for Nursing Practice (ICNP)[1]

Introduction to future trends in the field of medical coding

Recent trends to translate small bodies of diagnostic and procedural codes to a larger, often tiered pool of codes could significantly codify healthcare and alter our tracking and analysis of health-care-related data. While this change represented an opportunity to explore big-data analysis for increasingly specific health events, the complexity represents issues such as incorrect categorization and over and under compensating providers. In addition, with some codes expected to have little usage, experts fear that codes will be abandoned or be used to generate incorrect inferences. Critics (Maron, 2015; Robbins, 2018) were quick to point to code V97.33CD which indicates you were sucked into a jet engine, and this is your subsequent visit to a doctor, as a particularly glaring example.

In addition to expanded uses of coded data, changes to regulations, compliance and reimbursement will continue to need to be absorbed into practice. Increasingly, the interoperability of medical technology including electronic health records (EHR) is having an impact on all aspects of medical record keeping and the development of computer-assisted coding to facilitate faster and more efficient record-keeping are areas to watch.

Current Procedural Terminology

Current Procedural Terminology (CPT)® codes, maintained by the American Medical Association (https://www.ama-assn.org/amaone/cpt-current-procedural-terminologyhttps://www.ama-assn.org/amaone/cpt-current-procedural-terminology) are used for reporting healthcare procedures, along with the appropriate ICD-10 diagnosis code, for reimbursement. As an example, code 11600 specifies an excision of a malignant lesion of .5 cm or less including margins with the lesion situated either in the trunk, arms or legs. In addition to

the claims codes, CPT includes a set of supplemental tracking codes, known as CPT II, used for performance measurement and tracking of products, supplies and services not included as a CPT code. As an example, a blood pressure reading can be reported with supplemental code 2000F along with a visit code. While these type of codes don't always result in additional reimbursement, it allows stakeholders to monitor trends in field practices. Category III codes are not mandated by a governmental body, but like CPT II codes track new technology usage.

Current regulations and established guidelines

The United States Office of Inspector General (OIG) oversees the claims process that healthcare providers participate in to receive reimbursements for services and goods. These regulations help prevent fraud and abuse by healthcare providers and preserve confidentiality of healthcare information. Published on January 16, 2009, the final rule of the U.S. Department of Health and Human Services (HHS) required implementation of ICD-10 for medical coding related to Health Insurance Portability and Accountability Act (HIPAA).

For population and longitudinal study reasons, the World Health Organization (WHO) http://www.who.int/) maintains and provides an informational knowledgebase on several internationally endorsed classifications in order to foster comparison of data. WHO deploys three types of classifications on health parameters that have been approved by its policy forum known as the World Health Assembly. Field organizations supporting medical coding for American audiences include:

- American Academy of Professional Coders (AAPC)
  AAPC provides educational and certification services. Popular certifications offered include: CPC, COC, CIC, CRC, CPB, CPMA, CDEO, CPCO, CPPM, and specialty certifications.
- American Health Information Management Association (AHIMA)
  AHIMA is a field leader in healthcare fields that integrate or manage technology. Popular certifications offered include: CCS, CCA, CDI, LTC, RHIT, and RHIA.
- Healthcare Billing & Management Association (HBMA)
  A networking organization provides timely information to members.
- Medical Association of Billers (MAB)
  The Medical Association of Billers is a training and credentialing association for medical billing and coding with licensed curricular products.
- The Professional Association of Healthcare Coding Specialists (PAHCS)
  A networking organization provides timely information to members.

In terms of established guidelines, a group of the American Health Information Management Association (AHIMA), the all-volunteer Clinical Terminology and Classification Practice Council, identify key issues in clinical terminology and classification that are expected to receive continued focus regarding policy and guidance.

Terms for this chapter

- Nomenclature –a relatively simple system of names
- Vocabulary - a system of names with explanations of their meanings

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