



Standard Guide for Construction of a Clinical Nomenclature for Support of Electronic Health Records¹

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INTRODUCTION

The first ASTM guide for the construction of a new clinical nomenclature was published in 1989 (Guide E 1284). It reflected the knowledge and insight of that time. Subsequently, substantial progress has taken place in this subject area, mostly as part of the efforts toward the development of electronic healthcare records. These efforts have indicated that a clinical nomenclature is a *sine qua non* (tool), the heart of the electronic patient records generation, and the experience gained has provided some new and some modified criteria for such a clinical nomenclature. These recent developments have prompted Subcommittee E31.12 to revise Guide E 1284 and to include the new knowledge and information that has accumulated during the last few years.

1. Scope

1.1 This guide covers the clinical terms used in everyday clinical communication.

1.2 This guide does not cover terminology listings prepared for other purposes such as those for reimbursement, literature retrieval or scientific reference encoding, because the criteria for these types of term listings are significantly different from those to be observed when a nomenclature is constructed for the support of clinical informatics activities.

1.3 This guide is intended to outline the nosologic concepts for a clinical nomenclature that is designed to support electronic healthcare records.

1.4 The purpose of this guide is to describe the desiderata (needed requirement) for a nomenclature that is dedicated to clinical use and can serve as a way for maintaining nationwide compatibility among electronic healthcare records generated in the United States.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 1384 Guide for Description for Content and Structure of an Automated Primary Record of Care²

E 1769 Guide for Properties of Electronic Health Records and Record Systems²

2.2 ISO Standards:

ISO 5218 Information Interchange³

ISO 2955 Information Processing³

ISO 8072 Network Standards³

ISO 8601 Data Elements and Interchange Formats³

ISO 8859 Information Processing³

ISO 5218 IS Representation of the Human Sexes³

ISO IS 704 Principles and Methods of Terminology³

ISO DIS 860 International Harmonization of Concepts and Terms³

ISO DIS 1087-1 Terminology Work-Vocabulary-Part I: Theory and Application³

ISO DIS 1087-2 Terminology Work-Vocabulary-Part II: Computational Aids in Terminology³

ISO DIS 1951 Lexigraphic Symbols and Typographical Conventions for Use in Terminography³

ISO TR 9789 Information System Technology—Guidelines for the Organization and Representation of Data Elements for Data Interchange—Coding Methods and Principles³

ISO IS 1024 International Terminology Standards—Preparation and Layout³

ISO DIS 12616 Translation-Oriented Terminology³

ISO DIS 12200 Terminology—Computer Applications—

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² *Annual Book of ASTM Standards*, Vol 14.01.

³ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

Machine Readable Terminology Interchange Format³
ISO DIS 12620 Terminology—Computer Applications—
Data Categories³

2.3 ANSI Standards:

ANSI ASCX12 Version 3, Release 3³

ANSI X3.30 Representation for Calendar Date and Ordinary Date³

ANSI X3.43 Information Systems Representation of Local Time of Day for Information Exchange³

ANSI X3.51 Representations of Universal Time, Local Time Differentials, and United States Time Zone References for Information Interchange³

2.4 Other Standards:

HL7: Health Level Seven Version 2.2⁴

ACR/NEMA: DICOM Version 3.0

CEN ENV 12262 Model of Semantics

3. Terminology

3.1 Definitions of Terms Specific to This Standard: Term definitions in this section are limited to the characterization of the meaning of terms in context of this guide, namely, the meaning for construction of a clinical nomenclature for the support of automated creation of electronic health records.

3.1.1 attribute selection for hierarchical classification—choice of a characterizing feature of a class of concepts that allows partitioning, as defined by the architects of the classification system. (Three most successful classification systems used a single attribute: botany used binomial attribute, biology related classification to evolution, chemistry utilized the atomic weight.)

3.1.2 class term—a term that encompasses terms that are in one sense similar but in some another sense heterogeneous, dissimilar. A class term is clinically meaningfully partitioned, when this partitioning results in subclasses with increased similarity among the members of each subclass.

3.1.3 class term partitioning—the act of separating a class concepts into subclasses, where the created subclasses include all members of the partitioned class term.

3.1.4 classified system—systematic arrangement of concepts into categories according to preset explicit criteria, following a chosen nosologic scheme, such a hierarchical or matrix arrangement.

3.1.5 compound hierarchy—a stepwise hierarchical arrangement where more than one attribute is used for partitioning. The most appropriate attribute to guide the act of partitioning is chosen by the architects of the nomenclature.

3.1.5.1 Discussion—Design of a particular equally good hierarchy tree is not to be viewed as necessarily the only acceptable partitioning scheme. An alternative is the matrix design. Furthermore, partitioning of some class terms is controversial. For example, the concept anemia, an obvious class term, may be partitioned on the basis of the size of the red cells (normocytic, macrocytic and microcytic anemias), by the use of erythrokinetic differences (increased loss or insufficient production of red cells), or on the basis of the reticulocyte

level. The “best” attribute chosen by the architects of the nomenclature should be critically evaluated in terms of the current view of clinical practice with regard to that particular class term partitioning (textbooks, monographs, etc.), and the impact of a particular class term partitioning upon the retrieval of that term or related terms in actual usage.

3.1.6 concept—a summarizing abstract idea derived from a generalizing process, following an abstracting mental process. Concept is a general notion to represent a class of objects.

3.1.6.1 clinical concept—a mental image generated and used within the domain of clinical activities, based on the characteristics of a class of real-world instances, including the features typically associated with or suggested by that image.

3.1.7 health record—the collection of data and information gathered, or generated, to document (clinical care rendered to an individual) the conditions of an individual and any health care planned, ordered, or rendered.

3.1.7.1 electronic health record—a comprehensive, structured set of clinical, demographic environmental, social, and financial data and information, in electronic form, documenting the health care planned, ordered, or rendered related to a single individual. The electronic health record may include health related information from non-clinical sources that may not fully conform to the standardized clinical nomenclature. Even so, when possible, such information should be interpreted and classified, according to the paradigm of the clinical nomenclature. This will allow handling such material effectively.

3.1.8 hierarchical classified system—a special subset of classified systems with stepwise ranking of the concepts where subordinated lower level concepts are the result of a partitioning process, based on a preselected and clearly stated attribute(s).

3.1.9 lexical meaning—the definition of the meaning, a word or phrase generally, out of context, as listed in appropriate lexicons, such as medical dictionaries.

3.1.10 nomenclature—comprehensive systematized terminology where the preferred terms are ordered into a classified system based on their meaning and where semantic kinships are held together.

3.1.11 nosology—the science and technology of naming and classifying clinical concepts, such as anatomic terms, biochemical and physiologic terms, symptoms, signs, clinical problems and diagnoses, terms of etiology and therapy, nursing, and others used by healthcare team members. Nosology is domain specific.

3.1.11.1 nosologic scheme—a currently accepted and prevailing thinking about organization of clinical concepts based on accepted classification theories (probabilistic reasoning, fuzzy set theory, etc.).

3.1.12 single-key hierarchy—also called directly hierarchy, is a stepwise hierarchical arrangement of concepts using the same single attribute (the key) for partitioning throughout the nomenclature.

3.1.12.1 Discussion—Theoretically, all clinical terms should be classifiable into a single-key hierarchy where all class terms and subclass terms are based on a single key such as etiology, or outcome, or some other preselected key attribute. Our present knowledge does not allow the creation of

⁴ Available from Health Level 7, 3300 Washtenaw Ave., Suite 227, Ann Arbor, MI 48108.