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Hälsa- och sjukvårdsinformatik – Kategoristruktur för terminologier för människans anatomi (ISO 16278:2016)

Health informatics – Categorical structure for terminological systems of human anatomy (ISO 16278:2016)

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Denna standard ersätter SS-EN 15521:2007, utgåva 1.

The European Standard EN ISO 16278:2016 has the status of a Swedish Standard. This document contains the official English version of EN ISO 16278:2016.

This standard supersedes the Swedish Standard SS-EN 15521:2007, edition 1.

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EUROPEAN STANDARD

EN ISO 16278

NORME EUROPÉENNE

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English Version

Health informatics - Categorical structure for terminological systems of human anatomy (ISO 16278:2016)

Informatique de santé - Structure catégorielle des systèmes terminologiques de l'anatomie humaine (ISO 16278:2016)

Medizinische Informatik - Kategoriale Struktur für terminologische Systeme der Anatomie des Menschen (ISO 16278:2016)

This European Standard was approved by CEN on 15 January 2016.

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European foreword

This document (EN ISO 16278:2016) has been prepared by Technical Committee ISO/TC 215 "Health informatics" in collaboration with Technical Committee CEN/TC 251 "Health informatics" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2016, and conflicting national standards shall be withdrawn at the latest by September 2016.

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Endorsement notice

The text of ISO 16278:2016 has been approved by CEN as EN ISO 16278:2016 without any modification.

Introduction

This International Standard specifies a categorial structure for terminologies of human anatomy. Computer-based processing and the interchange of medical or clinical information requires various kinds of terminological systems to represent that information, such as controlled vocabularies, classifications, nomenclatures, terminologies and thesauri, with or without coding schemes.

The specific terminological issues in the field of health informatics are the following:

- large number of different terminological systems are available in different clinical specialties;
- large overlap among the subject fields involved;
- large number of codes and rubrics, typically in the order of magnitude of 10 000 to 100 000 entries, in commonly used terminological systems;
- increasing need for re-use of coded data in different health-care contexts;
- polysemy across different clinical specialties and sometimes within them.

The integration of computer-based medical records and administrative information systems in Electronic Health Records (EHR) require rationalization in the field, and a uniform way to represent the meaning of medical concepts to ensure that the receiver EHR of a message will catch the meaning introduced by the sender EHR and not only the string of characters embedded in it.

It is not possible to impose a rigid, uniform, standardized, natural language clinical terminology on healthcare professional providers. Nevertheless, standards need to be provided for guiding the development of terminologies in the different sub domains of healthcare to allow semantic interoperability between them. To this end, a domain specific semantic representation has been developed (EN 12264) and applied in a series of specific initiatives, including European Pre standards (ENV), European Standards (EN) and International Standards (ISO) on various subject fields to describe a set of categorial structures in partially overlapping subject fields. Human anatomy is central to medical terminology (surgical procedures, carcinoma staging, annotation of radiological findings, disease, clinical laboratory and so forth) and also to many scientific and bio-informatics study beyond the scope of clinical medicine. In the US, the University of Washington has developed in the public domain an anatomical terminology for EHR named the Digital Anatomist Foundational Model of Anatomy (FMA for short), a reference ontology for biomedical informatics.

International Standardization efforts by CEN and ISO related to Electronic Health Records and semantic interoperability have resulted in a number of categorial structures which are a step towards supporting healthcare terminological systems with a full concept system or ontology that in turn will support multipurpose uses and safe communication. In the present categorial structure standard, several of the definitions of basic terms related to categorial structures have been updated to comply with the most recent version of ISO 17115.

Adequate field testing in several countries, revision and integration have provided the comprehensive basis for this International Standard.

Health informatics — Categorial structure for terminological systems of human anatomy

1 Scope

This International Standard defines the characteristics required to synthetically describe the organization and content of human anatomy within a terminological system. It is intended primarily for use with computer-based applications such as clinical electronic health records, decision support and for various bio-medical research purposes.

This International Standard will serve to

- facilitate the construction of new terminological systems in a regular form which will increase their coherence and expressiveness,
- facilitate maintenance of human anatomy within terminological systems,
- increase consistency and coherence of existing terminological system,
- allow systematic cross-references between items of human anatomy in different types of terminological systems,
- facilitate convergence among human anatomy within terminological systems,
- make explicit the overlap for human anatomy between different health care domains terminological systems,
- provide elements for negotiation about integration of different terminological systems into information systems between the respective developers, and
- enable the systematic evaluation of human anatomy within terminological systems.

The International Standard itself is not suitable or intended for use by, individual clinicians or hospital administrators.

The target groups for this International Standard are the following:

- designers of specialized standard healthcare terminological categorial structures;
- developers of healthcare terminological systems including classifications and coding systems;
- producers of services for terminological systems and designers of software including natural language processing;
- information modellers, knowledge engineers, and standards developers building models for health information management systems;
- developers of information systems that require an explicit representation of healthcare terminological systems;
- developers of marked-up standards for representation of healthcare documents.

This International Standard does not include categorial structure that might be necessary for the description of developmental anatomy during the human life cycle, which includes prenatal development, post-natal growth and aging.

This International Standard has been developed for use as an integrated part of computer-based applications and for the electronic healthcare record. It would be of limited value for manual use.

It is not the purpose of this International Standard to standardize the end user classification of human anatomy terminology or to conflict with the concept systems embedded in national practice and languages.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
human anatomy
biological science that concerns the discovery, analysis and representation of the structural organization of the human body

Note 1 to entry: Human anatomy thus defined encompasses the material objects from the granularity level of the whole human body to that of cell parts, portions of body substances, and non-material entities such as surfaces, spaces, lines and points, that form the phenotypic organization of the human body. Although encompassed by the definition of anatomical structure (3.2.9), biological macromolecules do not come under the purview of the science human anatomy.

2.2
anatomical entity
entity that constitutes the structural organization of a particular human body

2.3
spatial dimension
number of dimensions of the entity in space

EXAMPLE 1 Entities with spatial dimension of value 3 are organs, cells and body cavity.

EXAMPLE 2 Entities with spatial dimension of value 2: the plane of the esophagogastric junction and the surface of the parietal part of the head.

EXAMPLE 3 Entities with spatial dimension of value 1: pectinate line, linea aspera and superior nuchal line.

EXAMPLE 4 Entities with spatial dimension of value 0: the pointed extremity of petrous part of temporal bone, pointed extremity of the orbit and the pointed extremity of the sacrum.

2.4
three-dimensional shape
shape of an anatomical entity of spatial dimension with value 3

EXAMPLE Hollow cylinder.

2.5
terminology
set of designations belonging to one special language

[SOURCE: ISO 1087-1:2000]

2.6
anatomical term
verbal designation of an *anatomical entity* (2.2)

2.7
anatomical category
type of anatomical entity shared by all the individual instances in existence in the present, past and future

EXAMPLE The anatomical category liver is instantiated by this liver and all individual livers in existence in the present, past and future.

Note 1 to entry: Anatomical categories may be more or less general. Where one anatomical category is subsumed by another, the *is_a* relation is asserted to obtain between the more specific or subsumed category and the more general or subsuming anatomical category.

Note 2 to entry: Each anatomical entity instantiates some anatomical category.

2.8

anatomical relation

relation between two or more anatomical categories derived from corresponding relations between instances of the respective categories

EXAMPLE 1 A is_a B defined to obtain when every entity in category A is at the same time an entity in category B.

EXAMPLE 2 B has_part A defined to obtain when every entity in category B has some entity in category A as part.

Note 1 to entry: Other examples of anatomical relations manifesting this every-some structure are: contained_in adjacent_to, and attached_to.

Note 2 to entry: The definition is adapted from the representation of types of characteristics in EN 12264 and authorised by an *anatomical domain constraint* (2.9).

2.9

anatomical domain constraint

rule prescribing the set of representations of *anatomical relations* (2.8) that are valid to specialize an *anatomical category* (2.5) in a certain domain

Note 1 to entry: The definition is adapted from domain constraint in EN 12264.

2.10

anatomical categorial structure

minimal set of *anatomical domain constraints* (2.9) for representing *anatomical entities* (2.2) in a precise domain to achieve a precise goal

Note 1 to entry: The definition is adapted from the categorial structure in EN 12264.

3 Categorial structure for terminologies of human anatomy description

3.1 Principles

The categorial structures for terminologies of human anatomy are in conformity with the categorial structure as prescribed by EN 12264:2005, Clause 4.

To describe an anatomical categorial structure (2.10), the following information shall be provided:

- a) anatomical categories (2.7) that organize the anatomical entities (2.2) and the anatomical relations (2.8) dividing their representation in the domain;
- b) precise goal of the anatomical categorial structure (2.10);
- c) list of the representations of anatomical relations (2.8) authorized by anatomical domain constraints (2.9);
- d) list of minimal anatomical domain constraints (2.9) required by the goal of the anatomical categorial structure (2.10).