

Health informatics — Categorial structure for terminologies of human anatomy

The European Standard EN 15521:2007 has the status of a
British Standard

ICS 35.240.80

National foreword

This British Standard is the UK implementation of EN 15521:2007.

The UK participation in its preparation was entrusted to Technical Committee IST/35, Health informatics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2007

© BSI 2007

ISBN 978 0 580 57038 4

Amendments issued since publication

Amd. No.	Date	Comments

English Version

Health informatics - Categorical structure for terminologies of human anatomy

Informatique de santé - Structure catégorielle des terminologies d'anatomie humaine

Medizinische Informatik - Kategoriale Struktur für Terminologien der Anatomie des Menschen

This European Standard was approved by CEN on 7 October 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	5
1.1 Main purpose.....	5
1.2 Target groups.....	5
1.3 Topics outside the scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 Categorial structure for terminologies of human anatomy description	7
4.1 Principles	7
4.2 Anatomical categories (3.7)	8
4.3 Precise goal of the categorial structure (3.8).....	10
4.4 List of anatomical relations (3.8).....	11
4.5 List of minimal anatomical domain constraints (3.9).....	13
5 Conformance.....	13
Annex A (informative) A reference ontology for biomedical informatics: the Foundational Model of Anatomy	14
A.1 General.....	14
A.2 Principles, Ontological Framework and Implementation of the FMA.....	14
A.3 Extensions of the FMA beyond human macroscopic anatomy	15
A.4 Relations in the FMA and their influence on other ontologies	16
A.5 Querying the FMA.....	16
A.6 Evaluation of the FMA	17
A.7 Uses and Selected Applications of the FMA.....	17
A.7.1 Research in ontologies, informatics and computer science	17
A.7.2 Research in biomedical imaging	18
A.7.3 Design of information systems	18
A.7.4 Clinical Informatics.....	18
A.7.5 Education.....	18
A.7.6 Sources of Anatomical Information	19
Bibliography.....	20

Foreword

This document (EN 15521:2007) has been prepared by 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 May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard : Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This European 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:

- 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;
- poly-semia 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 ISO standards 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.

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

1 Scope

1.1 Main purpose

This European standard defines the characteristics required to synthetically describe the organisation 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 European 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;
- enable the systematic evaluation of human anatomy within terminological systems.

1.2 Target groups

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

The target groups for this European standard are:

- designers of specialised 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.

1.3 Topics outside the scope

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

This European 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 European Standard to standardise the end user classification of human anatomy terminology or to conflict with the concept systems embedded in national practice and languages.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Not applicable.

3 Terms and definitions

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

3.1

Human anatomy

biological science that concerns the discovery, analysis and representation of the structural organisation of the human body

NOTE 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 organisation of the human body. Although encompassed by the definition of anatomical structure (4.2.9), biological macromolecules do not come under the purview of the science human anatomy.

3.2

anatomical entity

entity that constitutes the structural organisation of a human body

3.3

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 apex of petrous part of temporal bone, apex of the orbit and the apex of the sacrum.

3.4

three-dimensional shape

shape of an anatomical entity of spatial dimension with value 3

EXAMPLE Hollow cylinder.