

BS EN ISO 18104:2014



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Health informatics — Categorial structures for representation of nursing diagnoses and nursing actions in terminological systems

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National foreword

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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.

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(ISO 18104:2014)

Informatique de santé - Structures catégoriques pour la
représentation des diagnostics de soins et des actions de
soins dans les systèmes terminologiques (ISO 18104:2014)

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Pflegediagnosen und Pflegeaktionen in terminologischen
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Foreword

This document (EN ISO 18104:2014) 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of an identical text or by endorsement, at the latest by August 2014, and conflicting national standards shall be withdrawn at the latest by August 2014.

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Endorsement notice

The text of ISO 18104:2014 has been approved by CEN as EN ISO 18104:2014 without any modification.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 215, *Health informatics*.

This second edition cancels and replaces the first edition (ISO 18104:2003), which has been technically revised. For the history of the revision and a summary of the changes, see the Introduction and [Annex A](#).

Introduction

Development of terminological systems (also referred to as terminologies) to support nursing has been motivated by multiple factors including the need to

- describe nursing in order to educate and inform students and others,
- represent nursing concepts in electronic systems and communications, including systems that support multiprofessional team communications and personal health records, and
- analyse data about the nursing contribution to patient care and outcomes — for quality improvement, research, management, reimbursement, policy and other purposes.

Multiple terminologies exist to support representation of concepts for healthcare purposes; some of these are relevant to the nursing domain. In the context of health informatics, there is a clear requirement for both domain coverage and for interoperability among computer-processable terminological systems that support nursing. Nursing terminologies, or those parts of healthcare-related terminologies that are relevant to nursing, include concept representations for nursing diagnoses and nursing actions.

A nursing diagnosis is a label assigned to an assessment finding, event, situation or other health issue to indicate that it is considered to be noteworthy by the nurse and, where possible, the subject of care. Nursing actions are acts performed by or under the direction of a nurse, with the intention of directly or indirectly improving or maintaining the health of a person, group or population, the precise scope of nursing actions being delineated in each jurisdiction. These concepts and the scope of nursing practice are further elaborated in [Annex B](#).

The first edition of this International Standard^[1] focused on the conceptual structures that are the basis of nursing terminologies in order to support interoperability. A major purpose was “to establish a nursing reference terminology model consistent with the goals and objectives of other specific health terminology models in order to provide a more unified reference health model”. This purpose is still relevant to this revision of the standard, to support interdisciplinary communication, for example, where single, shared records are used, including records held by patients.

Following ISO rules, a review of ISO 18104:2003 was undertaken during 2008/09; ISO national member bodies, nursing organisations, industry representatives and experts provided comment. In addition to evaluation of the purpose, target groups, definitions and provisions of the standard, the review considered the implications of relevant International Standards published since 2003. The main findings/recommendations of the review were as follows.

- a) The standard was being used in at least 11 member countries and by several international terminology development organizations.
- b) Any revision should be based on a clearly articulated value proposition supported by evidence from the review. Published examples of use and value are provided in the Bibliography, linked to the specific purposes stated in [Clause 1](#). There is anecdotal evidence of other uses, including supporting design of terminology content in electronic record systems.
- c) Normative references and definitions to be updated. Other relevant international work needed to be considered, such as the World Health Organization Family of International Classifications (WHO-FIC) International Classification of Healthcare Interventions (ICHI).^[2]
- d) A review of relevant International Standards confirmed that the naming of some categories might need to be revised and that some categories could have been more appropriately designated as semantic links.
- e) Responses indicated that “dimension” and “potentiality” in the diagnosis model and “target” in the action model were not applied reliably by different users and required further consideration.

- f) It was recommended that a model for outcomes be considered and that informative annexes clarify the relationship between the model for diagnoses and the model for actions, as well as points of intersection between terminology models and information models.
- g) A number of reviewers recommended that the standard be supported by implementation guidance/examples, and that the title and the language used be revised, so that it would be better understood by target groups.

This second edition addresses these findings and recommendations. In the main body of the standard, two redundant categories have been removed (*dimension* and *recipient of care*) and changes have been made to correct errors, clarify meaning and update definitions. [Annex A](#) summarizes the changes. The standard defines the structure of terminological expressions for nursing diagnoses and nursing actions; the professional meaning of these constructs and their relationship to other record components is addressed in [Annex B](#) along with points of intersection between terminology models and information models. An informative description of categorial structures and their implementation is provided by [Annex C](#).

Health informatics — Categorical structures for representation of nursing diagnoses and nursing actions in terminological systems

1 Scope

This International Standard specifies the characteristics of two categorical structures, with the overall aim of supporting interoperability in the exchange of meaningful information between information systems in respect of nursing diagnoses and nursing actions. Categorical structures for nursing diagnoses and nursing actions support interoperability by providing common frameworks with which to

- a) analyse the features of different terminologies, including those of other healthcare disciplines, and to establish the nature of the relationship between them,^{[3]–[8]}
- b) develop terminologies for representing nursing diagnoses and nursing actions,^{[9]–[12]}
- c) develop terminologies that are able to be related to each other,^{[3] [8] [13]} and
- d) establish relationships between terminology models, information models and ontologies in the nursing domain.^{[14]–[16]}

There is early evidence that the categorical structures can be used as a framework for analysing nursing practice^[17] and for developing nursing content of electronic record systems.^{[18] [19]}

This International Standard is applicable to the following user groups:

- developers of terminologies that include nursing diagnosis and nursing action concepts;
- developers of categorical structures and terminologies for other healthcare domains, to support clarification of any relationship to or overlap with nursing concepts;
- developers of models for health information management systems such as electronic health records and decision support systems, to describe the expected content of terminological value domains for particular attributes and data elements in the information models;
- developers of information systems that require an explicit system of concepts for internal organization, data warehouse management or middleware services;
- developers of software for natural language processing, to facilitate harmonization of their output with coding systems.

It is not intended for use by clinical nurses without health informatics expertise. However, [Annex C](#) provides an introduction to categorical structures to assist those without health informatics expertise to contribute to its development, review, implementation and evaluation.

NOTE 1 Although the scope of testing and review of the first edition of this International Standard has been limited to nursing, the two categorical structures have features in common with the more general framework for clinical findings [ISO/TS 22789 and the domain-specific categorical structure for surgical procedures (ISO 1828) ^[20] as well as with the WHO ICHI].^[2] The standard may therefore inform development of other general and domain-specific categorical structures in healthcare.

Topics considered outside the scope of this International Standard include

- complete categorical structures that would cover all the potential details that could appear in expressions of nursing diagnoses and nursing actions,
- a detailed terminology of nursing diagnoses or nursing actions,

- a “state model” for diagnoses or actions — for example, provisional diagnosis or absent diagnosis, planned action or action not to be done — see [Annex A](#),
- diagnoses made and actions undertaken by nurses working in other professional roles — see [Annex B](#) — and
- knowledge relationships such as causal relationships between concepts — see [Annex B](#).

NOTE 2 Throughout the main body of this International Standard, where terms such as nursing diagnosis and nursing action are used, these refer to representation of these concepts in electronic systems, not to the professional activity of making a diagnosis or performing an action.

2 Normative references

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

ISO 17115, *Health informatics — Vocabulary for terminological systems*

ISO/TS 22789, *Health informatics — Conceptual framework for patient findings and problems in terminologies*

EN 12381, *Health informatics — Time standards for healthcare specific problems*

EN 12264, *Health informatics — Categorical structures for systems of concepts*

3 Terms and definitions

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

NOTE Where terms used in this document are not defined in this clause, they are considered to be generic to the English language or not specific to this document. In cases where they are not defined in this document nor generic to the English language, terms can be found using the Joint Initiative for Global Standards Harmonization Health Informatics Document Registry and Glossary’s standards knowledge management tool (SKMT): www.skmtglossary.org.

3.1 General

3.1.1

concept

unit of knowledge created by a unique combination of *characteristics* ([3.1.4](#))

Note 1 to entry: A concept can have one or more names. It can be represented using one or more terms, pictures, icons or sounds.

3.1.2

categorical structure

minimal set of *domain constraints* ([3.1.5](#)) for representing concept systems in a subject field

Note 1 to entry: [Annex C](#) provides further explanation.

3.1.3

category

division of sets of *entities* ([3.1.6](#)) regarded as having particular shared *characteristics* ([3.1.4](#))

EXAMPLE Oral route, subcutaneous route and all other routes share characteristics particular to the category *route* ([3.4.3](#)).

Note 1 to entry: Categories may be more or less general. Where one category is subsumed by another, the *isA* relation is asserted to obtain a hierarchy between the more specific or subsumed category and the more general or subsuming category. For example, parenteral route is more general than intravenous route.

Note 2 to entry: Each *entity* (3.1.6) instantiates some category.

3.1.4

characteristic

abstraction of a property of an *entity* (3.1.6) or of a set of *entities* (3.1.6)

EXAMPLE Fever is a *characteristic* symptom of flu.

Note 1 to entry: Characteristics are used for describing *concepts* (3.1.1) and for differentiating *categories* (3.1.3).

3.1.5

domain constraint

rule prescribing the set of *sanctioned characteristics* (3.1.8) that are valid to specialize a concept representation in a subject field

EXAMPLE *Administration of drug possiblyhasRoute subcutaneous* describes the fact that drugs can be administered subcutaneously in the specific context that the terminology applies to.

Note 1 to entry: Different levels of sanctioning are possible, e.g. conceivable, sensible, usuallyInTheContextOf, normal, necessary.

3.1.6

entity

any concrete or abstract thing of interest

EXAMPLE Aspirin, environment, parent, symptom, mobility

Note 1 to entry: This definition is similar to that for *object* in ISO 1087-1: anything perceivable or conceivable. ISO 1087-1 notes that objects may be material (e.g. an engine, a sheet of paper, a diamond), immaterial (e.g. conversion ratio, a project plan) or imagined (e.g. a unicorn). However, the term *object* is normally interpreted as representing a material thing, therefore *entity* is preferred.

3.1.7

representation relation

semantic link

formal representation of a directed associative relation or partitive relation between two *concepts* (3.1.1)

EXAMPLE hasFocus; actsOn.

Note 1 to entry: A *representation relation* (3.1.7) always has an inverse, i.e. another representation relation with the opposite direction. The inverse may or may not be explicitly stated. For example, isFocusOf (inverse of hasFocus); isTargetOf (inverse of actsOn).

3.1.8

sanctioned characteristic

formal representation of a type of *characteristic* (3.1.4)

EXAMPLE hasFocus symptom; hasSite altered structure.

3.1.9

terminological system

terminology

structured human and machine-readable representation of clinical *concepts* (3.1.1) required directly or indirectly to describe health conditions and healthcare activities, and allow their subsequent retrieval or analysis

Note 1 to entry: It also refers to the relationship of the terminology to the specifications for organizing, communicating and interpreting such a set of concepts.

3.2 Categories of healthcare entities for nursing diagnoses

3.2.1

clinical course

onset and/or duration

EXAMPLE Acute, chronic, sudden.

Note 1 to entry: See [Annex A](#) for discussion of clinical course

Note 2 to entry: Does not include time related expressions [see *timing* ([3.2.9](#))].

3.2.2

clinical finding

any state observed directly or indirectly concerning a subject of care and their relationship with the environment

Note 1 to entry: A single descriptor (e.g. anxiety, pain) can serve the role of both *focus* ([3.2.4](#)) and *judgement* ([3.2.5](#)). Such clinical finding expressions are also valid for representation of nursing diagnoses.

3.2.3

degree

relative severity or intensity

EXAMPLE Mild, moderate, severe.

3.2.4

focus

area of attention

EXAMPLE Tissue integrity, body temperature, activity of daily living.

Note 1 to entry: Focus *categories* ([3.1.3](#)) that are valid for representation of a nursing diagnosis include, but are not limited to property, process, structure, state, and behaviour.

Note 2 to entry: Focus may be qualified by *site* ([3.2.7](#)), for example, movement of leg, tissue integrity of left heel.

3.2.5

judgement

opinion or discernment related to a *focus* ([3.2.4](#))

EXAMPLE Impaired, reduced, ineffective.

Note 1 to entry: Judgement *categories* ([3.1.3](#)) that are valid for representation of a nursing diagnosis include, but are not limited to, alteration, adequacy, and effectiveness.

3.2.6

potential

inherent capacity for coming into being

Note 1 to entry: Descriptors for potential are limited to *risk for* and *opportunity for* and their synonyms.

3.2.7

site

anatomical structure

Note 1 to entry: Site *categories* ([3.1.3](#)) that are valid for expressions of nursing diagnoses are body component, and altered structure (e.g. a wound).

3.2.8

subject of information

type of *entity* (3.1.6) to which the nursing diagnosis refers

Note 1 to entry: Subject of information *categories* (3.1.3) valid for representation of a nursing diagnosis are individual, group and physical environment.

Note 2 to entry: The implied subject of information is the *subject of record* (3.4.4) which is not generally expressed in the terminological phrase. A term for subject of information should be used when necessary to disambiguate the subject of information from the (implied) subject of the record, e.g. sibling distress vs. (patient) distress.

3.2.9

timing

occurrence or a point or period in time

EXAMPLE After meals, in childhood, morning.

Note 1 to entry: For representation of time-related concepts, refer to EN 12381.

3.3 List of authorized representation relations for nursing diagnoses

NOTE Inverse representation relation for *hasX* is *isXFor* unless otherwise noted.

3.3.1

hasClinicalCourse

representation relation (3.1.7) between the nursing diagnosis and qualifier *clinical course* (3.2.1)

EXAMPLE In the expression *sudden reduction in body weight*, the nursing diagnosis *reduction in body weight* hasClinicalCourse *sudden onset*.

3.3.2

hasDegree

representation relation (3.1.7) between the nursing diagnosis and qualifier *degree* (3.2.3)

EXAMPLE Severe pain — hasFinding *pain*, hasDegree *severe*.

3.3.3

hasFinding

representation relation (3.1.7) between the nursing diagnosis and the *clinical finding* (3.2.2)

EXAMPLE Risk for infection — hasFinding *infection*, hasPotential *risk for*.

3.3.4

hasFocus

representation relation (3.1.7) between the nursing diagnosis and the *focus* (3.2.4)

EXAMPLE Excessive calorie intake — hasFocus *calorie intake*, hasJudgement *excess*.

3.3.5

hasJudgement

representation relation (3.1.7) between the nursing diagnosis and the *judgement* (3.2.5)

EXAMPLE Unable to perform activities of daily living — hasFocus *performance of activities of daily living*, hasJudgement *unable*.

Note 1 to entry: Inverse representation of hasJudgement relation is *isAppliedTo*.

3.3.6

hasPotential

representation relation (3.1.7) between the nursing diagnosis and the descriptor of *potential* (3.2.6)

EXAMPLE Risk for pressure ulcer — hasFinding *pressure ulcer*, hasPotential *risk for*.