INTERNATIONAL STANDARD

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Health informatics — Integration of a reference terminology model for nursing

Informatique de santé — Intégration d'un modèle de terminologie de référence pour les soins infirmiers

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Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 18104 was prepared by Technical Committee ISO/TC 215, *Health informatics*. Through a work item proposal initiated by the International Council of Nurses and the Nursing Informatics Special Interest Group of the International Medical Informatics Association, the work related to this International Standard takes forward, under the Vienna Agreement, the efforts initiated in ENV 14032, *Health Informatics — System of concepts to support nursing*.

Introduction

Terminology development in nursing has been motivated by multiple factors including

- implementation of computer-based systems in clinical settings,
- quest for reimbursement for nursing services delivered,
- documentation of nursing contributions to patient care outcomes,
- teaching students, and
- enhancing the body of nursing knowledge.

Nursing terminologies, in either paper-based or computer-based form, have been designed as enumerated classifications and implemented both as interface terminologies at the point of care and as administrative terminologies to examine nursing data across settings. At the present time, many standardized terminologies exist and no single standardized terminology is complete for the domain in terms of breadth or granularity. Moreover, there is currently no concept-oriented terminology that integrates the domain concepts of nursing in a manner suitable for computer processing.

In recent years, however, significant advances have been made toward the development of concept-oriented reference terminologies that support the domain concepts of nursing. Among the remaining major challenges are the development of a reference terminology model that supports the representation of nursing concepts and the integration of the reference terminology model with other models for the health-care domain [1]. A number of efforts have focused on addressing these challenges. Prominent among these is the work within the European Standardization Committee (CEN TC 251) that brought together the efforts of the International Classification for Nursing Practice (ICNP®) Programme, Telenurse ID, and other European efforts (e.g., nursing activities within the Galen programme) into a Prestandard — ENV 14032 [2], [3], [4], [5], [6]. Also of relevance to this International Standard are activities related to the International Medical Informatics Association Nursing Informatics Special Interest Group, Nursing Terminology Summits, Systematized Nomenclature of Medicine (SNOMED®) Convergent Terminology Group for Nursing, Health Level 7, and Clinical Logical Observation Identifiers, Names, and Codes (LOINC) [3], [7], [8], [9].

In contrast to the CEN Prestandard that broadly addressed categorial structures for nursing diagnoses and nursing actions, this International Standard focuses specifically on the conceptual structures that are represented in a reference terminology model rather than in other types of information models. Moreover, toward the goal of integration with other health-care models, the reference terminology models for nursing diagnoses and nursing actions in this International Standard reflect attempts at harmonisation with evolving terminology and information model standards outside the domain of nursing.

Health informatics — Integration of a reference terminology model for nursing

1 Scope

1.1 Main purpose

The purpose of this International Standard is 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 International Standard includes the development of reference terminology models for nursing diagnoses and nursing actions and relevant terminology and definitions for its implementation.

The potential uses for this reference terminology model are to

- support the intensional definition of nursing diagnosis and nursing action concepts reflective of a broad range of roles and practice settings,
- facilitate the representation of nursing diagnosis and nursing action concepts and their relationships in a manner suitable for computer processing,
- provide a framework for the generation of compositional expressions from atomic concepts within a reference terminology,
- facilitate the construction of nursing terminologies in a regular form which will make mapping among them easier,
- facilitate the mapping among nursing diagnosis and nursing action concepts from various terminologies including those developed as interface terminologies and statistical classifications,
- enable the systematic evaluation of terminologies and associated terminology models for purposes of harmonization, and
- provide a language to describe the structure of nursing diagnosis and nursing action concepts in order to enable appropriate integration with other reference terminology models and with information models.

1.2 Target groups

The target groups for this International Standard are

- developers of coding systems and terminologies that include nursing diagnosis and nursing action concepts, to assist in the development, refinement, and maintenance of a particular terminology, as well as for comparisons among different systems,
- developers of reference terminology models for other health-care domains, to explicate the relationships and overlap with nursing concepts,
- information modellers, knowledge engineers, and standards developers building 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 and middleware services,

- developers of software for natural language processing, to facilitate harmonisation of their output with coding systems, and
- developers of mark-up standards for representation of health-care documents.

1.3 Topics considered outside scope

Topics considered outside the scope of this International Standard include

- a comprehensive categorial structure for nursing diagnoses and nursing interventions,
- a detailed classification, nomenclature, or reference terminology of nursing diagnoses or nursing actions,
- descriptors and guidelines to represent contextual information for the recording of information within an electronic health record,
- an exhaustive list of all the potential details that could appear in expressions of nursing diagnoses and nursing actions,
- an exhaustive thesaurus with the complete list of descriptors to be used to describe nursing diagnoses and nursing actions,
- relationships among health professionals, and
- communication of nursing diagnosis and nursing action concepts between electronic health records.

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.

ISO/TS 17117:2002, *Health informatics — Controlled health terminology — Structure and high-level indicators*

ENV 12264:1997, *Medical informatics — Categorial structures of systems of concepts — Model for representation of semantics*

ENV 14032:2001, *Health Informatics — System of concepts to support nursing*

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply. Only key terms and definitions are provided in this section. Additional background terms and definitions from ISO 1087-1:2000 [27] are provided in Annex A. Definitions for the specific reference terminology model components are provided in Clauses 4 and 5.

3.1
domain concept model
set of formal categories, semantic links and sanctions describing potential characteristics for representing concepts in a domain

[ISO 17115]

3.2
reference terminology model
domain concept model (3.1) that is optimised for terminology management

3.3
dissection
systematic representation of a phrase according to a predefined domain concept model

4 Reference terminology model for nursing diagnoses

4.1 General

For the purposes of this International Standard, a nursing diagnosis is considered either as a <<judgement>>[1] on a <<focus>> or as a <<judgement>> on a particular <dimension>[2] (e.g. ability, knowledge) of a <<focus>> (see ENV 14032). A graphical representation of the reference terminology model for nursing diagnoses is shown in Figure 1. A descriptor for <<focus>> and a descriptor for <<judgement>> are mandatory for the intensional definition of a nursing diagnosis. In some special instances, a single descriptor (e.g., anxiety) can serve the role of both <<focus>> and <<judgement>>. In contrast to ENV 14032, no base category is specified; the decision is at the discretion of the terminology developer and/or implementer. Annex C includes examples of three styles of dissection: <<focus>> as the base category, <<judgement>> as the base category, and a single descriptor for <<focus>> and <<judgement>>. Descriptors for other semantic domains, semantic categories, and qualifiers described in 4.4 to 4.6 should be used as necessary to support the intensional definition of a specific nursing diagnosis.

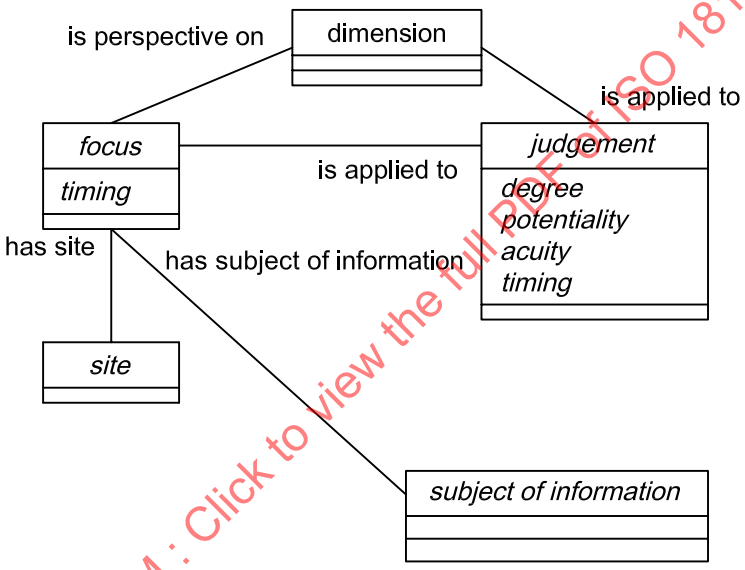

Figure 1 — Reference terminology model for nursing diagnoses

4.2 Focus

4.2.1 Definition

Focus is defined as an area of attention [10]. <<Focus>> may be qualified by timing.

4.2.2 Examples of semantic categories

Semantic categories for the domain of <<focus>> include, but are not limited to: <property>, <process>, <structure>, and <state>. In the case of <altered process>, <altered state> and <altered structure>, the descriptor of <<focus>> is pre-coordinated with the descriptor of <<judgement>>, e.g., anxiety. Categories of <<focus>> may also take the role of <<target>> in the reference terminology model for nursing actions.

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1) Semantic domains are considered as abstract classes of UML that are used as organising categories to simplify the models. Semantic domains are italicised in the diagrams and their labels are enclosed in double angle brackets << >> throughout the document.

2) Semantic categories are considered as instantiable classes in UML and their labels are in plain font in the diagrams. They are enclosed in angle brackets < > throughout the document.

4.3 Judgement

4.3.1 Definition

<<Judgement>> is an opinion or discernment related to a <<focus>> or <dimension> (modified from ENV 14032). A descriptor for <<judgement>> is mandatory for nursing diagnoses. <<Judgement>> may be qualified by degree, potentiality, timing, and acuity. Descriptors of degree (scale of gradations) include, but are not limited to: very, mild, and extreme. Descriptors of timing (a point or period in time) include, but are not limited to: during a procedure, perinatal, and postoperative. Descriptors of acuity (duration) include, but are not limited to: acute and chronic. Descriptors of potentiality (possibility) include, but are not limited to: risk for, actual, possibility of, and potential.

4.3.2 Examples of semantic categories

Semantic categories in the judgement domain include, but are not limited to: <alteration>, <adequacy>, <altered process>, <altered state> and <altered structure>. In the case of <altered process>, <altered state> and <altered structure>, the descriptor of <<judgement>> is pre-coordinated with the descriptor of <<focus>>, e.g. anxiety.

4.4 Dimension

4.4.1 Definition

<Dimension> is a quality possessed by an <individual> or <group> which provides a perspective on, but is not limited to: <process>, <structure>, other semantic categories taking the role of focus, and nursing diagnosis (see ENV 14032). <Dimension> may also take the role of <<target>> in the reference terminology model for nursing actions.

4.4.2 Examples of descriptors for the semantic category

Example descriptors include, but are not limited to: knowledge, motivation, and ability.

4.5 Subject of information

4.5.1 Definition

<<Subject of information>> is an entity to which a diagnosis refers, also known as the “bearer” in ENV 14032. A descriptor for <<subject of information>> should be used as necessary to disambiguate similar rubrics (e.g., ineffective family coping vs. ineffective individual coping) in a terminology.

4.5.2 Examples of semantic categories

Semantic categories in the <<subject of information>> domain include, but are not limited to: <individual>, <group>, and <physical environment>.

4.6 Site

4.6.1 Definition

A physical structure that further specifies the position of a <<focus>> or a <<target>> (see ENV 14032).

4.6.2 Examples of semantic categories

Semantic categories include, but are not limited to: <body component>, <altered structure> (e.g., a wound), and <device>.

4.7 Semantic links

All semantic links, with the exception of the reciprocal of is applied to (IS JUDGED BY), were included in ENV 14032. Examples of use of the semantic links are provided in Annex C.

has acuity
semantic link used to represent associative relations between the qualifier of acuity and <<judgement>>

has degree
semantic link used to represent associative relations between the qualifier of degree and <<judgement>>

has potentiality
semantic link used to represent associative relations between the qualifier of potentiality and <<judgement>>

has subject of information
semantic link used to represent associative relations between <<focus>> and <<subject of information>>

has site
semantic link used to represent associative relations between <<focus>> and <<site>>

has timing
semantic link used to represent associative relations between the qualifier of timing and <<judgement>>, <<focus>>, and <action>.

is applied to (IS JUDGED BY)
semantic links used to represent associative relations between <<judgement>> and <<focus>> and <dimension>

is perspective on
semantic link used to represent associative relations between <<focus>> and <dimension>

5 Reference terminology model for nursing actions

5.1 General

For the purposes of this International Standard, a nursing action is considered an intentional act applied to a <<target>> through an <action>. A graphical representation of the reference terminology model for nursing actions is shown in Figure 2. A descriptor for <action> and a descriptor for <<target>> are mandatory for the intensional definition of a nursing action. Annex D includes examples of dissections. Descriptors for other semantic domains, semantic categories, and qualifiers described in 5.4 to 5.7 should be used as necessary to support the intensional definition of specific nursing actions within a particular terminology.

5.2 Action

5.2.1 Definition

An <action> is the process by which an intentional service is applied to a recipient of care [11], [12]. Actions are frequently represented in compositional expressions as verbs or verb phrases. All nursing actions have an <action>. <action> may be qualified by timing.

5.2.2 Examples of descriptors for the semantic category

Examples of descriptors for <action> include, but are not limted to: observing, teaching, preventing, and feeding. In some terminologies (e.g., ICNP®, Home Health Care Classification) [13], [14] instances of nursing <actions> are classified into broad categories such as assessing, teaching, performing, caring, and managing.

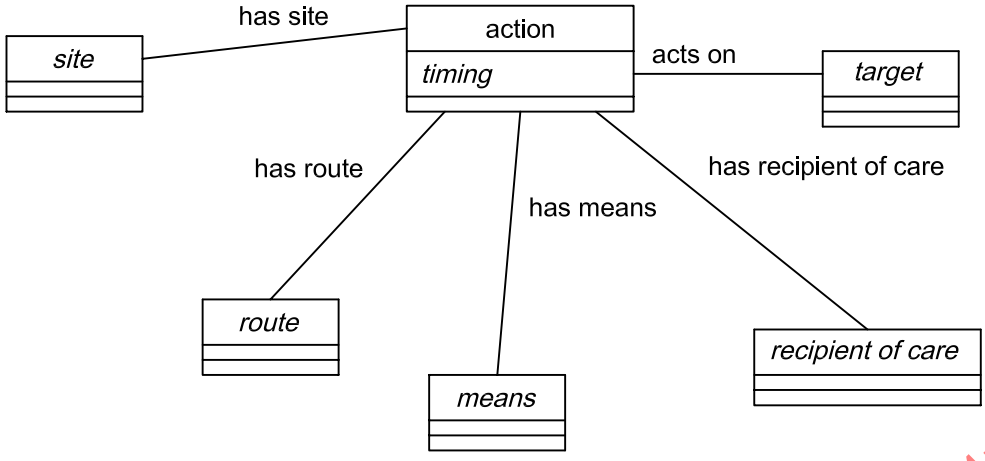

Figure 2 — Reference terminology model for nursing actions

5.3 Target

5.3.1 Definition

<<Target>> is the entity that is affected by the nursing action or that provides the content of the nursing action [11], [13], [15]. All nursing actions have a <<target>>.

5.3.2 Examples of semantic categories

Semantic categories in the <<target>> domain include, but are not limited to: <body component>, <sign>, <device>, <substance>, <physical environment>, <resource>, <process>, <dimension>, <individual>, <group>, and the categories that have the role of <<focus>> in nursing diagnoses (see 4.2). Nursing diagnosis can also be a <<target>>.

5.4 Means

5.4.1 Definition

<<Means>> is the entity used in performing a nursing action [13].

5.4.2 Examples of semantic categories

Semantic categories include, but are not limited to: <resource>, <device> and <substance>.

5.5 Route

5.5.1 Definition

<Route> is a path through which something may pass (see ENV 14032).

5.5.2 Examples of descriptors for the semantic category

Example descriptors for <route> include, but are not limited to: oral route, subcutaneous, and epidural.

5.6 Site

5.6.1 Definition

<<Site>> is a physical structure that further specifies the position of a <<focus>> or a <<target>> (see ENV 14032).

5.6.2 Examples of semantic categories

Semantic categories include, but are not limited to: <body component>, <altered structure> (e.g. a wound), and <device>.

5.7 Recipient of care

5.7.1 Definition

The <<recipient of care>> is the person, family, group, or other aggregate to whom the action is delivered. <<Recipient of care>> should be used when necessary to avoid ambiguities in a set of descriptors within a terminology.

5.7.2 Examples of semantic categories

Examples of semantic categories include, but are not limited to: <individual>, <group>, and <physical environment>.

5.8 Semantic links

acts on
semantic link used to represent associative relations between <action> and <<target>>

has recipient of care
semantic link used to represent associative relations between <action> and <<recipient of care>>

has means
semantic link used to represent associative relations between <action> and <<means>>

has route
semantic link used to represent associative relations between <action> and <route>

has site
semantic link used to represent associative relations between <action> and <<site>>

has timing
semantic link used to represent associative relations between the qualifier of timing and <<judgement>>, <<focus>>, and <action>

Annex A
(informative)

Examples of dissections of nursing diagnoses

A.1 General

This Annex provides examples of dissections of nursing diagnoses. The sources of the diagnoses are the ENV 14032 informative Annex (denoted by *) and selected terms from standardized terminologies that include nursing diagnoses including the North American Nursing Diagnosis Association Taxonomy 1 and Taxonomy 2, the Home Health Care Classification, and the Omaha System. The following dissections are constructed under the assumption that the default value for potentiality is “actual” and that the default value for <<subject of information>> is “client”. The reference terminology model proposed in this International Standard specifies that either <<judgement>> or <<focus>> can serve as the base category for concept definition. Thus, in the first set of examples, <<judgement>> is used as the base category. In the second set, <<focus>> is used as the base category. The third set of examples is nursing diagnoses that contain both <<focus>> and <<judgement>> in a simple term.

A.2 Examples with Judgement as base category

A.2.1
decreased parenting ability
decrease

has potentiality	actual
is applied to	ability
is perspective on	parenting
has subject of information	client

A.2.2
reduction of ability to bathe oneself*
reduction

has potentiality	actual
is applied to	ability
is perspective on	bathing oneself
has subject of information	client

A.2.3
reduced ability to write*
reduction

has potentiality	actual
is applied to	ability
is perspective on	writing
has subject of information	client

A.2.4
activities of daily living alteration
alteration

has potentiality	actual
is applied to	activities of daily living
has subject of information	client

A.2.5
inability to toilet
inadequacy
has potentiality actual
is applied to ability
is perspective on toileting
has subject of information client

NOTE This example makes explicit the fact that “inability” is a nominalisation of “unable”, i.e. that the “ability” is “inadequate”.

A.2.6
alteration in sexuality patterns*
alteration
has potentiality actual
is applied to sexuality pattern
has subject of information client

A.2.7
alteration in gastrointestinal tissue perfusion*
alteration
has potentiality actual
is applied to perfusion
has site gastrointestinal tissue
has subject of information client

A.2.8
reduction in ability to concentrate*
reduction
has potentiality actual
is applied to ability
is perspective on concentrating
has subject of information client

A.2.9
impaired gas exchange
impairment
has potentiality actual
is applied to gas exchange
has subject of information client

A.2.10
decreased cognitive ability
decrease
has potentiality actual
is applied to ability
is perspective on cognition
has subject of information client

A.3 Examples with Focus as base category

A.3.1
risk of altered body temperature
body temperature
has judgement altered
has potentiality risk of
has subject of information client

A.3.2
non-compliance with medication regimen
medication regimen

has perspective	compliance
has judgement	inadequate
has potentiality	actual
has subject of information	client

A.3.3
compromised family coping
coping

has judgement	compromised
has potentiality	actual
has subject of information	family

A.3.4
ineffective thermal regulation
thermal regulation

has judgement	ineffective
has potentiality	actual
has subject of information	client

A.3.5
risk of impaired skin integrity
skin integrity

has judgement	impaired
has potentiality	risk of
has subject of information	client

A.3.6
fluid volume deficit
fluid volume

has judgement	deficit
has potentiality	actual
has subject of information	client

A.3.7
decreased cardiac output
cardiac output

has judgement	decreased
has potentiality	actual
has subject of information	client

A.3.8
impaired tissue integrity
tissue integrity

has judgement	impaired
has potentiality	actual
has subject of information	client

A.3.9
disturbed sleep pattern
sleep pattern

has judgement	disturbed
has potentiality	actual
has subject of information	client

A.3.10
inadequate social support
social support
has judgement inadequate
has potentiality actual
has subject of information client

A.4 Examples with Judgement and Focus pre-coordinated as a simple term

A.4.1
risk of suffocation*
suffocation
has potentiality risk of
has subject of information client

A.4.2
anxiety*
anxiety
has potentiality actual
has subject of information client

A.4.3
pain*
pain
has potentiality actual
has subject of information client

A.4.4
fear*
fear
has potentiality actual
has subject of information client

A.4.5
bleeding*
bleeding
has potentiality actual
has subject of information client

A.4.6
postoperative nausea*
nausea
has potentiality actual
has timing postoperatively
has subject of information client

A.4.7
pressure ulcer*
pressure ulcer
has potentiality actual
has subject of information client

A.4.8
constipation*
constipation
has potentiality actual
has subject of information client

A.4.9
risk of infection*
infection
has potentiality risk of
has subject of information client

Annex B
(informative)

Examples of dissections of nursing actions

B.1 General

This Annex provides examples of dissections of nursing actions. These nursing actions represent a selection from among those included in the informative Annex of ENV 14032 (denoted by *), terms from nursing records, and additional nursing actions selected from standardized nursing terminologies including the Home Health Care Classification, Nursing Interventions Classification, Omaha System, Patient Care Data Set, and Perioperative Nursing Data Set.

Note that it may be desirable to introduce additional semantic links and semantic categories not considered in this International Standard as needed for the organisation of a particular terminology system and the requirements for differentiating among similar expressions.

The following dissections are constructed under the assumption that the default value for the <<recipient of care>> is “client”.

B.2 Examples of dissections of nursing actions

B.2.1
replace dressing*
replacing

acts on	dressing
has recipient of care	client

B.2.2
removal of drain*
removing

acts on	drain
has recipient of care	client

B.2.3
removal of urethral catheter*
removing

acts on	urethral catheter
has recipient of care	client

B.2.4
checking position of nasogastric tube*
checking

acts on	position of nasogastric tube
has recipient of care	client

B.2.5
deflating balloon on pulmonary artery catheter
deflating

acts on	pulmonary artery catheter balloon
has recipient of care	client

B.2.6
pressure ulcer assessment
assessing

acts on	pressure ulcer
has recipient of care	client

B.2.7
changing colostomy bag*
changing

acts on	colostomy bag
has recipient of care	client

B.2.8
observation of vital signs*
observing

acts on	vital signs
has recipient of care	client

B.2.9
physiotherapy referral
referring to

acts on	physiotherapy
has recipient of care	client

B.2.10
monitor blood pressure*
monitoring

acts on	blood pressure
has recipient of care	client

B.2.11
teach caregiver about diabetes
teaching

acts on	diabetes
has recipient of care	caregiver

B.2.12
administer insulin*
administering

acts on	insulin
has recipient of care	client

B.2.13
suctioning secretions in airway through trachea*
suctioning

acts on	secretions
has site	airway
has route	through trachea
has recipient of care	client

B.2.14
feeding client using an enteral tube*
feeding

acts on	client
has means	enteral tube
has recipient of care	client

B.2.15
administration of analgesics into epidural space*
administering

acts on	analgesics
has site	epidural space
has recipient of care	client

B.2.16
monitor blood glucose via finger stick
monitoring

acts on	blood glucose
has means	finger stick
has recipient of care	client

B.2.17
assess abdominal girth
assessing

acts on	girth
has site	abdomen
has recipient of care	client

B.2.18
give clear liquids when awake
giving (administering)

acts on	clear liquids
has timing qualifier	when awake
has recipient of care	client

B.2.19
administer water bolus via feeding tube
administering

acts on	water bolus
has means	feeding tube
has recipient of care	client

B.2.20
perform cast care
performing

acts on	cast care
has recipient of care	client

B.2.21
assess intake/output
assessing

acts on	intake/output
has recipient of care	client

B.2.22
learning readiness enhancement
enhancing

acts on	learning readiness
has recipient of care	client

B.2.23
assess skin at bony prominences for reddened or raised areas
assessing

acts on	skin for reddened or raised areas
has site	bony prominences
has recipient of care	client

B.2.24
teach skin care to family
teaching
- acts on — skin care
- has recipient of care — family

B.2.25
monitor community immunization rate
monitoring
- acts on — immunization rate
- has recipient of care — community

B.2.26
emotional support
supporting
- acts on — emotion
- has recipient of care — client

B.2.27
assessment of readiness for behaviour change
assessing
- acts on — readiness for behaviour change
- has recipient of care — client

B.2.28
monitor family coping
monitoring
- acts on — coping
- has recipient of care — family

B.2.29
assess mental status using Mini Mental Status Exam
assessing
- acts on — mental status
- has means — Mini Mental Status Exam
- has recipient of care — client

B.2.30
observe mother-baby interaction
observing
- acts on — interaction
- has recipient of care — mother-baby dyad

Annex C
(informative)

Examples of dissections of diagnoses and actions from disciplines other than nursing

C.1 General

This Annex provides examples of dissections of diagnoses and actions from disciplines other than nursing to illustrate the manner in which the models could be used to model terms from other disciplines. Specifically, terms related to dentistry, medicine, occupational therapy, pharmacy, physiotherapy, social work, and surgery were chosen.

Note that it may be desirable to introduce additional semantic links and semantic categories not considered in this International Standard as needed for the organisation of a particular terminology system and the requirements for differentiating among similar expressions.

As with the nursing examples in Annexes A and B, the following dissections are constructed under the assumption that the default value for the <<recipient of care>> is "client". For diagnoses, the dissections use <<focus>> as the base category.

C.2 Examples of dissections

C.2.1
impaired cognition
cognition

has judgement	impaired
has potentiality	actual
has subject of information	client

C.2.2
severe post-operative abdominal incision pain
pain

has potentiality	actual
has degree	severe
has timing	post-operative
has site	abdominal incision
has subject of information	client

C.2.3
inadequate nutrition
nutrition

has judgement	inadequate
has potentiality	actual
has subject of information	client

C.2.4
possible right otitis media
otitis

has potentiality	possible
has site	right middle ear
has subject of information	client

C.2.5
coronary artery disease
disease
- has potentiality — actual
- has site — coronary artery
- has subject of information — client

C.2.6
abcessed tooth
tooth
- has judgement — abcessed
- has potentiality — actual
- has subject of information — client

C.2.7
unsteady gait
gait
- has judgement — unsteady
- has potentiality — actual
- has subject of information — client

C.2.8
inadequate family income
income
- has judgement — inadequate
- has potentiality — actual
- has subject of information — family

C.2.9
decreased range of motion left ankle
range of motion
- has judgement — decreased
- has potentiality — actual
- has site — left ankle
- has subject of information — client

C.2.10
elevated bilirubin
bilirubin
- has judgement — elevated
- has potentiality — actual
- has subject of information — client

C.2.11
service coordination
coordinating
- acts on — service
- has recipient of care — client

C.2.12
administer chest physiotherapy as appropriate
administering
- acts on — physiotherapy
- has site — chest
- has recipient of care — client
- has timing — as appropriate

C.2.13
movement facilitation
facilitating
acts on movement
has recipient of care client

C.2.14
physiotherapy referral
referring
acts on physiotherapy
has recipient of care client

C.2.15
referral to occupational therapist
referring
acts on occupational therapist
has recipient of care client

C.2.16
occupational therapy evaluation
evaluating
acts on occupational therapy
has recipient of care client

C.2.17
diet counselling
counselling
acts on diet
has recipient of care client

C.2.18
nutritional management
managing
acts on nutrition
has recipient of care client

C.2.19
dietary assessment
assessing
acts on diet
has recipient of care client

C.2.20
referral to social worker
referring
acts on social worker
has recipient of care client

C.2.21
work capacity evaluation
evaluating
acts on work capacity
has recipient of care client

C.2.22
removal of foreign body
removing
acts on foreign body
has recipient of care client

C.2.23
bicuspid extraction
extracting

acts on	bicuspid
has recipient of care	client

C.2.24
dental procedure consultation
consulting

acts on	dental procedure
has recipient of care	client

Annex D
(informative)

Conventions used in figures of models

D.1 Introduction

The modelling technique in the diagrams follows the conventions described within the Unified Modelling Language (UML) with minor exceptions. This Annex contains a brief overview of the diagram conventions used in this document. However, modelling is used in this International Standard only to demonstrate consistency and to illustrate the domain. It is not the intention of this International Standard, or this Annex to present this modelling method, or its implementation, as a general method for modelling healthcare information for other purposes.

Only the UML constructs actually used in the diagrams are presented in this Annex.

D.2 Classes

A class represents a set of objects with similar structure, behaviour, and relationships. This document provides a graphical notation for the relationships between instances of the classes (See Figure D.1) where this adds to the clarity of the description of the domain. All classes are described textually in the normative clauses and in Annex A (informative).

NOTE An instance of a class may be called an “object”.

Within UML, a class is shown as a solid-outline rectangle with 3 compartments separated by horizontal lines. The upper name compartment holds the class name; the middle compartment holds a list of attributes; the bottom list compartment holds a list of operations.

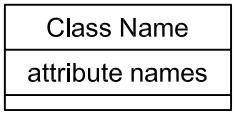

Figure D.1 — Representation of classes in diagrams

In the diagrams in Figure 1 and Figure 2, the representation of a class includes only two compartments, the name compartment and the attribute compartment. The labels in the upper compartment represent either semantic categories or semantic domains. Qualifiers are considered as UML attributes and thus appear in the middle compartment.

D.3 Associations between classes

A solid line between two class symbols illustrates an association between those classes. The line is labelled with an indication of the nature of the association (see Figure D.2).

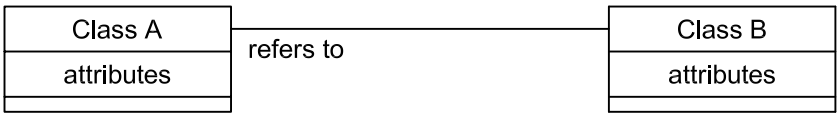

Figure D.2 — Illustration of associations between classes

In this International Standard, the labeled lines represent semantic links. Direction is implied by the position of the label.

D.4 Specialisation and abstract classes

A generalisation/specialisation relationship between classes implies that the specialised class is a kind or subtype of the generalised class. A generalisation may be an abstract class. In this case, no instances of the generalised class exist except as instances of one of the specialised classes. The names of abstract classes are italicised in the diagrammatic representations of the model.

In this International Standard, semantic domains are considered as abstract classes of UML that are used as organising categories to simplify the models. Semantic domains are italicised in the diagrams and their labels are enclosed in double angle brackets << >> throughout the document. Semantic categories are considered as instantiable classes. They appear in plain font in the diagrams and their labels are enclosed in angle brackets < > throughout the document. In UML, specialised classes inherit all attributes, relationships, and services from their generalised class(es). Therefore, in this International Standard, the semantic categories will inherit all attributes, relationships, and services from the semantic domains in which they appear.