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Health Informatics — Categorial structure for representation of Traditional Chinese  
**Medicine**~~medicine~~ clinical decision support system

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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 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 215, *Health informatics*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The aim of Traditional Chinese ~~Medicine~~medicine clinical decision support ~~systems~~systems (TCMCDSS) is to help prescribe ~~the~~ Chinese materia medica (CMM) and other therapies that ~~fits~~fit the patient's personal situation ~~in~~with respect ~~of~~to effectiveness and toxicity of the medicine. The imbalance between supply and demand of medical resources ~~lead~~leads to a huge demand for TCMCDSS, through which TCM diagnosis and treatment schemes can be optimized, ~~and~~ the effectiveness and safety of primary medical care can be improved. ~~So~~Hence the establishment of TCMCDSS is in line with clinical practice ~~need~~needs and ~~it~~ has the requirements of real application scenarios. However, different TCMCDSS lack a unified semantic information framework, which affects the data exchange and sharing among different institutions and databases.

In conclusion, a unified semantic classification framework will greatly enhance the completeness, accuracy of TCMCDSS, which will establish a solid foundation for the sharing and utilization of the data in the future.

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Health ~~Informatics~~ ~~informatics~~ — ~~Categorial structure for representation of Traditional Chinese Medicine~~ ~~medicine~~ clinical decision support system

## 1 ~~1~~ Scope

This document specifies the categorial structure within the ~~subject~~ field of ~~TCM~~ ~~Traditional Chinese medicine~~ clinical decision support system by defining a set of domain constraints of sanctioned characteristics, each composed of a relationship and an applicable information model ~~in order to represent the concept of TCM clinical decision support system.~~ ~~The Western medicine and Japanese Kampo medicine are out of this scope. TCMCDSS shall not be used for these medicines. The design and management of artificial intelligence diagnosis and treatment systems is out of the scope.~~

~~2 This document is not applicable to Western medicine and Japanese Kampo medicine. It is not applicable to the design and management of artificial intelligence diagnosis and treatment.~~

## 2 Normative references

The following documents, ~~are referred to in whole the text in such a way that some or in part, are normatively referenced in all of their content constitutes requirements of 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 17115:2020 Health informatics — Representation of categorial structures of terminology (CatStructure)~~

## 3 ~~3~~ Terms and definitions

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

ISO and IEC maintain ~~terminological~~ terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: ~~http://www.iso.org/obp~~ available at <https://www.iso.org/obp>

— IEC Electropedia: <http://www.electropedia.org/> available at <https://www.electropedia.org/>

### 3.1 General

#### 3.1 General

##### 3.1.1

##### concept

unit of knowledge created by a unique combination of characteristics

[SOURCE: ISO 1087:2019, 3.2.7, modified ~~notes~~ — Notes to entry deleted].]

##### 3.1.2

##### entity

~~any~~ concrete or abstract thing of interest

Note 1 to entry: Some information modelling methods use entity for their main information modelling construct, whilst others use entity type; ~~in this part of ISO/IEC 19763 the term entity type is used in preference to entity.~~

[SOURCE: ISO/IEC 10746-2:2009, 6.1, modified note added.]

### 3.1.3 relationship

association between two or more entities that is significant for some intended purpose

Note ~~4 to~~ 1 to entry: Can also be known as an association when the information model is based upon object classes.

[SOURCE: ISO 19440:2020, 3.64], modified — Note to entry added.

## ~~3.1.3.2~~ 3.2 ~~Characterizing~~ Characterizing categories

### 3.2.1

#### ~~TCM~~

#### Traditional Chinese medicine clinical decision support system

#### TCMCDSS

software designed to be a direct aid to TCM clinical decision-making, in which the characteristics of an individual patient are matched to a computerized TCM clinical knowledge base, where after patient-specific assessments or recommendations are presented to the TCM clinician or the patient to aid in the process of making evidence based clinical decisions

Note 1 to entry: These types of systems typically require input of patient-specific clinical variables and, as a result, recommendations are presented to the TCM clinician or the patient to aid in the process of making evidence based clinical decisions after patient-specific assessments.

Note 2 to entry: TCM clinical decision support system mainly provides the diagnosis support of TCM and the treatment scheme recommendation of TCM.

[SOURCE: ISO/TS 22756:2020, 3.2, modified — Reference to ~~add~~ TCM] added and Notes to entry added.

#### 3.2.1.1

#### constitution

characteristics, partly genetically determined, partly acquired, of an individual, including structural and functional characteristics, temperament, adaptability to environmental changes and susceptibility to disease

[SOURCE: ISO/~~TS22835~~ TS 22835:2018, 3.9]

### 3.2.2

#### patient information

basic data which identifies the individual

Note 1 to entry: ~~The patient~~ Patient information includes ~~basic~~ information such as name, gender, age and occupation, symptom and sign information obtained through the four TCM (Traditional Chinese medicine) consultations, as well as the history of current illness and allergy.

### 3.2.3

#### four-diagnostic information

information obtained through the four diagnoses of Traditional Chinese medicine (TCM) (including the four diagnoses of TCM and four-diagnosis equipment), including symptoms, signs and other signs of TCM.

Note 1 to entry: "Four diagnoses" means a collective term for inspection, listening and smelling, inquiry, and palpation.

### 3.2.4

#### symptom and sign

bodily or mental phenomenon, circumstance or change of condition arising from and accompanying a disease or other pathological condition

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~~Note 1~~**Note 1** to entry: Subjective indications or behaviour disorder perceptible to the patient, and the abnormal signs discovered by ~~adoctor~~**a doctor**, are included.

[SOURCE: ISO 19465:2017, 5.2]

### 3.2.5

#### **health history**

patient's previous status and past illnesses, especially those closely related to the present illness.

EXAMPLE 1 ~~history~~**History** of diabetes, history of trauma surgery, prophylaxis, allergies.

EXAMPLE 2 ~~smoking~~**Smoking**, drinking, occupational exposure.

[SOURCE: ~~Yang zhiyin. big~~**Big** dictionary of diagnostics. ~~huaxia press.~~**2004**]

### 3.2.6

#### **algorithm**

step-by-step procedure for solving a mathematical problem; also used to describe step-by-step procedures for making a series of choices among alternative decisions to reach a calculated result or decision.

Note 1 to entry: TCM (**Traditional Chinese medicine**) disease and syndrome diagnosis and treatment scheme can be recommended based on algorithm and knowledge base.

EXAMPLE Support Vector Machine (SVM), ~~{Convolutional Neural Networks, (CNN)}~~**[SOURCE: SKMT, note added]**.

[SOURCE: SKMT, note added]

### 3.2.7

#### **knowledge base**

facts, information and skills on a specific topic as a set of declarative, hierarchical organization of such statements, and relationships between declarative statements

Note 1 to entry: ~~which~~**Which** serves as the underpinning of TCMCDSS.

[SOURCE: ISO/TS 22756:2020, 3.9~~modified~~**9, modified**]

### 3.2.8

#### **diagnosis recommendation**

##### **TCM**

**Traditional Chinese medicine** diagnosis suggestion to someone, which is produced by TCM clinical decision support system

### 3.2.9

##### **TCM**

#### **Traditional Chinese medicine disease diagnosis**

##### **TCM disease diagnosis**

judgment of the nature of illness with someone, by examining them closely

### 3.2.10

##### **TCM**

#### **Traditional Chinese medicine pattern diagnosis**

##### **TCM pattern diagnosis**

diagnostic conclusion of the pathological changes at a certain stage of a disease, including the location, cause, and nature of the disease as well as the trend of development, which suggest appropriate treatment



Note 1 to entry: TCM pattern is specific to the individual.

[SOURCE: World Health Organization (2007) International standard terminology for traditional medicine in Western Pacific Region]

### 3.2.11

#### intervention recommendation

activity including medication and other therapies proposed to maximize the prospects of achieving the patient's goals of care,

[SOURCE: SKMT, modified]

### 3.2.12

#### medication

substance that has an intended therapeutic effect on a patient and ~~may~~can influence the medication safety of a patient

Note 1 to entry: This would include prescribed, but also non-prescribed medication such as cough syrups. A placebo has the intent of a therapeutic effect and is thus considered medication. Alcoholic beverages however also influence medication safety, but are not considered to be medication because they do not have the intent of giving therapy.

[SOURCE: ISO/TR 20831:2017, 3.5]

### 3.2.13

#### physical therapy

non-medication treatments

~~Note 1~~Note 1 to entry: Some physical factors such as electricity, light, sound, temperature, magnetism, water and mechanical stimulation act on the body surface

EXAMPLE ~~acupuncture~~Acupuncture, massage, cold compress.

## 4 List of relationships for TCM CDSS

### 4.1 Categorial structure of TCM clinical decision support system

#### 4.1 Overview

The formal concept representation system in the field of TCM guideline evaluation includes characterizing categories (see 3.2) and semantic links (see 4.2). The outline of those characterizing categories and semantic links ~~are~~is illustrated in a concept diagram in Figure 1.

#### 4.2 ~~4.2.~~semantic link

##### 4.2.1 ~~4.2.1~~is the base of

use something as the thing from which something else is developed

It expresses the semantic link between ~~Knowledge~~knowledge base (see ~~3~~see 3.2.7) and algorithm (see 3.2.6).

EXAMPLE <Knowledge base> is the base of <algorithm>.

##### 4.2.2 ~~4.2.2~~is part of

Composes, with one or more other physical units, some larger whole. This includes component of, division of, portion of, fragment of, section of, and layer of.

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It expresses the semantic link between physical therapy (see 3.2.13) and intervention recommendation (see 3.2.11).

EXAMPLE <physical therapy> is part of <intervention recommendation>.

### **4.2.3 produce**

#### **4.2.3 produce**

brings forth, generates or creates.

It expresses the semantic link between TCMCDSS (see 3.2.1) and intervention recommendation (see 3.2.11).

EXAMPLE <TCMCDSS> produce <diagnosis recommendation>.

#### **4.2.4 is applied with**

Something used in a particular situation, activity, or process such as a method, idea, or material.

It expresses the semantic link between algorithm (see 3.2.6) and TCMCDSS (see 3.2.1). ~~relationships:~~  
EXAMPLE <algorithm> is applied with <TCMCDSS>.

### **4.2.5 optimize**

EXAMPLE <algorithm> is applied with <TCMCDSS>.

#### **4.2.5 optimize**

improve the way that something is done or used so that it is as effective as possible.

It expresses the semantic link between diagnosis recommendation (see 3.2.8) and TCMCDSS (see 3.2.1).

EXAMPLE <TCMCDSS> optimize <diagnosis recommendation>.

#### **4.2.6 affect**

#### **4.2.6 affect**

Produces a direct effect on. Implied here is the altering or influencing of an existing condition, state, situation, or entity. This includes has a role in, alters, influences, predisposes, ~~catalyzes, catalyses,~~ stimulates, regulates, depresses, impedes, enhances, to, leads to, and modifies.

It expresses the semantic link between diagnosis recommendation (see 3.2.8) and intervention recommendation (see 3.2.11).

EXAMPLE <diagnosis recommendation> ~~affect~~affects <intervention recommendation>.

#### **4.2.7 is processed by**

The action of certain standard traditional pharmaceutical technologies, which ~~change~~changes CMM into decoction pieces.

It expresses the semantic link between patient information (see 3.2.2) and TCMCDSS (see 3.2.1). ~~relationship : between patient information and TCMCDSS.~~

EXAMPLE <patient information> is processed by <TCMCDSS>.

## **5—5 Categorial structure of TCM clinical decision support system**

~~The following graph (figure Figure 1) illustrates the categorial structure for the subject field of TCM clinical decision system in the formal concept representation system.~~