FINAL
DRAFT

TECHNICAL
REPORT

ISO/DTR 4421

ISO/TC **215**

Secretariat: **ANSI**

Voting begins on:
2023-02-21

Voting terminates on:
2023-04-18

Health informatics — Introduction to Ayurveda informatics

Informatique de santé — Introduction à l'informatique sur l'Ayurveda

Reference number
ISO/DTR 4421:2023(E)

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Published in Switzerland

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Foreword

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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.

Introduction

Ayurveda, the “science of life”, integrally incorporates the concepts of health and disease and aims not only at treating a patient but also at maintaining wellbeing of a healthy person by achieving homeostasis of the body, mind, and spirit; referred to as the holistic approach (see Annex A).

With an increase in lifestyle-related disorders, there is a worldwide resurgence of interest in Ayurveda and other holistic systems of healthcare, particularly with respect to the prevention and management of chronic and non- communicable diseases. Today, more than 110 WHO member states use herbal medicine and more than 90 WHO member states have reported use of Ayurveda. In most of these countries Ayurveda treatment is covered by insurance too.

The globalization of Ayurveda calls for standardization in terms of terminology; clinical examination; diagnosis; maintenance of health records; interventions in form of herbs, herbal/ herbo-mineral formulations, diet and lifestyle; pharmaceuticals as well as pharmacovigilance specific to Ayurveda.

Application of standardized informatics tools in Ayurveda is poised to bring robustness in clinical decision support systems, electronic health records, telemedicine, processing and storage of data, automation of time consuming, subjective and labour-intensive clinical examination involving multi-layered parameters, personalized medication, identification of herbs, processing of formulations, pharmacovigilance and even drug re-positioning.

This document shares the concept diagram of Ayurvedic diagnosis. Since prevention of disease and maintaining health is an important concept in Ayurveda, this document shares the concept diagram for Ayurvedic analysis of a healthy subject in addition to an unhealthy subject.

The potential uses for this categorial structure are to:

— facilitate the representation of Ayurvedic analysis of a subject using a standard core model in a manner suitable for computer processing;

— support developers of new terminology systems concerning Ayurvedic medicine systems;

— facilitate mapping and integration between Ayurvedic and other Traditional medicinal models;

— facilitate meta-data association, automatic processing of medicinal literature and texts on Ayurvedic medicine systems and integration of the same with Ayurveda based EHR systems.

The potential beneficiaries of this document include:

— developers of Ayurveda and other traditional medicine based diagnosis and analysis systems;

— developers of information systems for patient findings, Ayurvedic medicinal treatment and its efficacy;

— informaticians, analysts, researchers who would require common models of knowledge to facilitate analysis of data available on traditional medicine;

— developers of EHR systems, aiming on interoperability of biomedicine and traditional medicine based systems.

Health informatics — Introduction to Ayurveda informatics

1 Scope

This document seeks to establish a baseline understanding of Ayurvedic medicine system. It introduces various elements and processes inherent and integral to Ayurvedic diagnosis and treatment. It establishes concept models for Ayurvedic analysis of a subject which can potentially form the basis of system models.

The following topics are out of scope of this document:

— concept models and categorial structures for the individual elements of the concept models proposed.

— individual Ayurvedic dosage forms or medicines or therapies.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

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

3.1 General terms

3.1.1
assessment of signs of disease
assessment of an observable indication of a disease, injury, or abnormal physiological state that can be detected during a physical examination, patient history taking, or a diagnostic procedure

3.1.2
assessment of symptoms of disease
assessment of the something out of the ordinary that is experienced by an individual or reported by a patient

3.1.3
Ayurveda
science of life where advantageous and disadvantageous, happy and unhappy states of life along with what is good and bad for life, its measurement and life itself are described

Note 1 to entry: Ayurveda deals with inter-individual variability for personalized and predictive medicine.

3.1.4
Ayurvedic medicinal treatment
ayurvedic pharmacological intervention involving administration of single herbs or compound formulations which can be internal or external

3.1.5
Ayurvedic surgery
ayurvedic intervention involving para-surgical or surgical interventions

3.1.6
Ayurvedic therapy
treatment of diseases or disorders, as by remedial, rehabilitating, or curative process described in Ayurveda

3.1.7
concept
unit of knowledge created by a unique combination of characteristics

[SOURCE: ISO 1087:2019, 3.2.7, modified — Note to entry removed.]

3.1.8
concept model
concept diagram formed by means of a formal language

[SOURCE: ISO 24156-1:2014, 3.2]

3.1.9
Daivavyapashraya chikitsa
divine therapy
non-pharmacological Ayurvedic intervention involving social and religious rituals based on faith

3.1.10
diagnosis
process of identifying a disease, condition, or injury from its signs and symptoms

Note 1 to entry: A health history, physical exam, and tests, such as blood tests, imaging tests, and biopsies can be used to help make a diagnosis.

3.1.11
disease
illness or medical condition, irrespective of origin or source, that presents or could present significant harm to humans

[SOURCE: WHO (2005)]

3.1.12
disease susceptibility
state of being predisposed to, or sensitive to, developing a certain disease

3.1.13
family predisposition
genetic predisposition
increased chance of developing a certain disease based on the genetic makeup

3.1.14
healthcare
care activities, services, management or supplies related to the health of an individual

Note 1 to entry: This includes more than performing procedures for subjects of care. It includes, for example, the management of information about patients, health status and relations within the healthcare delivery framework and can also include the management of clinical knowledge.

[SOURCE: ISO/TR 18307:2001, 3.70, modified — "Activities" and "management" added, note 1 to entry modified.]

3.1.15
healthy subject of healthcare
healthy person who uses, or is a potential user of, a health care service for the purpose of maintenance of health

3.1.16
herbs
crude plant material, such as leaves, flowers, fruit, seeds, stems, wood, bark, roots, rhizomes or other plant parts, which can be entire, fragmented or powdered

3.1.17
intervention
treatment, procedure, or other action taken to prevent or treat disease, or improve health in other ways

3.1.18
logical information model
information model that specifies the structures and relationships between data elements but is independent of any particular technology or implementation environment

[SOURCE: ISO 13972:2022, 3.1.8, modified — Second preferred term removed.]

3.1.19
miscellaneous factors
miscellaneous risk factors
different kinds of factors that have a potential to affect one's health

3.1.20
occupational factors
occupational risk factors
health risk factors associated with one's work or profession

3.1.21
personalized diet
tailored nutritional recommendations that promote and maintain an individual's health and helps to fight against existing diseases

3.1.22
personalized lifestyle
tailored lifestyle recommendations that promote and maintain an individual's health and helps to fight against existing diseases

3.1.23
prakriti
phenotype
body constitution type as per Ayurveda

3.1.24
preventive intervention
activity undertaken with the objective of improving human health by preventing disease, by curing or reducing the severity or duration of an existing disease, or by restoring function lost through disease or injury

3.1.25
Satvavjaya chikitsa
psychotherapy
non-pharmacological Ayurvedic intervention primarily aimed at behaviour correction by virtue of counselling, Yoga and meditation

3.1.26
staging of disease
Shadvidha kriyakaala
classification system that uses diagnostic findings to produce clusters of patients who require similar treatment and have similar expected outcomes

3.1.27
subject of healthcare
person who uses, or is a potential user of, a health care service

[SOURCE: ISO/TS 22220:2011, 3.2]

3.1.28
treatment
attempted remediation of a health problem, usually following a diagnosis

3.1.29
unhealthy subject of healthcare
unhealthy person who uses, or is a potential user of, a health care service for diagnosis, treatment, mitigation or cure of any specific disease, signs and/ or symptoms

3.1.30
use case diagram
diagram that shows relations between actors and use cases

3.1.31
vikriti
disturbed homeostasis leading to the condition of suffering from a disease

3.1.32
Yuktivyapashraya chikitsa
rational therapy
ayurvedic pharmacological intervention which can be internal or external

3.2 Characterizing categories

3.2.1
ayurvedic analysis of a healthy subject of healthcare
process of Ayurvedic analysis where the four factors, i.e. *prakriti* (3.1.23), *family predisposition* (3.1.13), *occupational factors* (3.1.20) and *miscellaneous factors* (3.1.19) are taken into consideration

3.2.2
ayurvedic analysis of an unhealthy subject of healthcare
process of Ayurvedic analysis where the five factors, i.e. *vikriti* (3.1.31), *prakriti* (3.1.23), *family predisposition* (3.1.13), *occupational factors* (3.1.20) and *miscellaneous factors* (3.1.19) are taken into consideration.

Note 1 to entry: In case of an unhealthy subject of healthcare, the processes of disease *diagnosis* (3.1.10), *staging of disease* (3.1.26) and *assessment of signs of disease* (3.1.1) and *assessment of symptoms of disease* (3.1.2) are used to elaborate the attributes associated with *vikriti* (3.1.31) or *disease* (3.1.11).

4 Semantic links

4.1 isAppliedTo

Relationship between the process and subject of healthcare (see 3.1.27).

It is the representation of the semantic link between the <subject of health care> (see 3.1.27) and the process of <Ayurvedic analysis> (see 3.2.1, 3.2.2) resulting into personalized diagnosis and <treatment> (see 3.1.28).

EXAMPLE <Ayurvedic analysis> isAppliedTo <subject of healthcare>.

4.2 hasCharacteristicOf

Characteristics/ data associated with a subject of healthcare (see 3.1.27).

It is the representation of the semantic link between the <subject of healthcare> (see 3.1.27) and the primary findings/ characteristics of the subject.

EXAMPLE <subject of healthcare> hasCharacteristicOf <prakriti>.

4.3 isA

Property of the main element is being inherited by the child.

It is the representation of the semantic link between two elements where the child element inherits all the properties of a parent element.

EXAMPLE <personalized diet> isA <treatment>.

4.4 includes

Products or processes being implemented as an integral part of the analysis of a subject of healthcare (see 3.1.27) in Ayurveda (see 3.1.3).

It is the representation of the semantic link between processes or products with another process or product where one is essential for successful completion of the other.

EXAMPLE <Ayurvedic analysis of unhealthy subject> includes <disease diagnosis>.

4.5 utilizes

Facts or information essential to the analysis of a subject of healthcare (see 3.1.27) in Ayurveda (see 3.1.3).

It is the representation of the semantic link between facts or information with a process where the fact or information is for successful completion of the other.

EXAMPLE <Ayurvedic analysis of unhealthy subject> utilizes <vikriti>.

4.6 resultsIn

Conclusion of the process of analysis of a subject of healthcare (see 3.1.27) in Ayurveda (see 3.1.3).

It is the representation of the semantic link between <treatment> (see 3.1.31) prescribed or conclusion of the process of analysis of <subject of healthcare> (see 3.1.27) in <Ayurveda> (see 3.1.3).

EXAMPLE <Ayurvedic analysis of unhealthy subject> resultsIn < satvavajaya chikitsa>.

5 Concept models

5.1 Subject of healthcare

The concept model for subject of healthcare (see 3.1.27) bifurcates the subject into two categories based on the attribute and characteristics. The formal concept model outlines the inheritance and semantic links (see Clause 4) in Figure 1.