

TECHNICAL REPORT

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Digital coding of oral health and care

*Codage numérique de l'état de santé et des interventions bucco-dentaires
(COSI)*

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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 main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 13668, which is a Technical Report of type 1, was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 3, *Terminology*.

It is a majority opinion amongst the ISO/TC 106/SC 3 member countries and experts in SC 3/WG 1 that this document should be considered as a guide for the establishment of a system of communication between the various dental codes existing in the world or as an example for the setting up of such codes where they do not exist.

In view of the developments that will certainly take place in the future, it would not be appropriate that this document be presently considered as an International Standard. It is therefore proposed under the form of a Technical Report for provisional application so that information and experience of its use in practice may be gathered. Comments on the content of this document should be sent to the ISO Central Secretariat.

Annex A forms an integral part of this Technical Report. Annexes B and C are for information only.

Introduction

This Technical Report is based upon the Oral Status and Intervention Index (OSI) adopted in 1983 via the WHO and FDI (see below) as a convenient classification index for oral health and treatment procedures¹⁾. This index classifies oral status and care on a scale from 0 to 9; the “0” representing the goal of health or “absence of need for care”; the higher numbers on the scale representing progressively:

- a) worse oral health status; and
- b) increasingly complicated, invasive and costly care interventions.

The upper limits, that is beyond “9”, refer to status for which interventions required are normally referred to specialist care, often of a multidisciplinary nature.

The index was developed by considering different states of oral disease and the skills and resources required to provide the care needed, including the cost, the complexity, the risk of failure and error in treatment and the associated pain and discomfort. It attempts to combine all these factors within one continuum with the aim of improving communication between health policy makers, the community, dental educators and the dental profession. The index thus provides the basis and orientation for an information system for managing, monitoring and reporting oral health and care services.

The World Health Organization (WHO) supports the development and use of numerical terminology and codes based on this concept for the use in oral care systems, as the index provides a health-oriented approach that enables the dental profession to relate care activities to the goal of health.

A further reason for supporting this concept is the potential to facilitate the development of new curricula and exchanges of teaching information and material. This is of special benefit to developing countries, as often teaching at university level is only provided in a foreign language.

The World Dental Federation (FDI) Standing Committee on Relations between the Trade, Industry and the Dental Profession approved the use of the OSI to classify instruments and materials needed for different tasks. It was agreed to promote the organization of trade and information materials in accordance with the index.

In the joint WHO and FDI efforts to promote and assist countries in developing appropriate oral care services for the whole of their populations, the facilitation of communication within all areas of the profession can only be a positive influence.

The coding for oral care procedures presented in this proposal should be seen as part of the development of a standardized management and monitoring system for oral care that should be suitable, with adaptation, for use in almost any oral care system. It is envisaged that the system will encompass the following areas:

- a) recording of oral health status of patients;
- b) codes for oral care procedures;
- c) a reporting system providing information on oral health and care.

1) WHO TRS 713 (1984) Prevention Methods and Programmes for Oral Diseases.
WHO TRS 750 (1987) Alternative Systems of Oral Care Delivery.
FDI INCOGUDET Resolution (Rio de Janeiro 1981).

Software to link the three components is now being developed that will be suitable for oral care for:

- countries with newly developing services and very few resources;
- countries at a moderate level of development; and
- highly industrialized countries.

Where there are extensive management systems already in place, such a system could provide linkages for international communication through computer-mediated translation.

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Digital coding of oral health and care

1 Scope

The purpose of this Technical Report is to provide a common basis for the communication of the recording of oral status and care in such a way that:

- a) communication be facilitated between professionals, irrespective of their country of practice;
- b) the collection of forensic evidence be facilitated;
- c) information be more readily available for monitoring the oral health of the public, planning future needs in the professional work force and preventive measures, etc.;
- d) guidance for compatibility of computer software in dealing with the management and practice of dentistry be provided;
- e) it may provide data in the planning and management of health insurance systems and organizations;
- f) it may be convenient for the post-marketing surveillance and performance evaluation of dental materials and procedures;
- g) a basis for the classification and marking of dental instruments, items of equipment, materials and devices is provided.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Technical Report. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Technical Report are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid Technical Reports.

ISO 3950:1984, *Dentistry — Designation system for teeth and areas of the oral cavity.*

ISO 8601:1988, *Data elements and interchange formats — Information interchange — Representation of dates and times.*

3 Principle

The proposal for the coding of information on oral care contained in this Technical Report differs from many existing systems in use, in that:

- a) it is based on the OSI that provides orientation, to relate oral care to the goal of health;
- b) the codes used are readily recognized because they have a standard structure (usually two digits) and an easily remembered meaning.

For example:

- a) the first digit of the intervention code is the OSI category number and the second digit is generally closer to, or further from "0", depending on the complexity or order of the procedure being considered.

Thus 52 is a direct-entry amalgam restoration and 57 is a crown or inlay; 83 is an enamel-bonded prosthesis and 86 is a bone-implanted prosthesis;

- b) for the tooth-surface site codes, the first digit gives the number of surfaces being considered, and the second digit indicates the surface or combination of surfaces.

Thus 11 is a one-surface occlusal filling, 12 is a one-surface mesial restoration and 41 is a four-surface OMDV filling.

Furthermore, this exclusively digital codification is based upon a sequence of columns, provisionally six/seven, headed "A" (or "Aa" and "Ab") to "F", each of them displaying, through a fixed number of significant digits, a part of the code, in the following order:

- a) identification of the patient (one or two columns);
- b) date of intervention;
- c) tooth or area of the oral cavity } anatomy axis;
- d) status and procedures
- e) topography of procedures
- f) steps in the procedure
- } intervention axis.

This codification is a basic one, intended to meet most needs. If necessary, supplementary digits or columns might be added.

The digital sentence is organized, where appropriate, into six (or more) columns as described in clause 4.

4 Syntax

4.1 Column(s) A: Identification

Coding the identification of the patient may not always be necessary or useful. In the private dental office, the patients are usually identified either by their name, or a nonsignificant number. Repetition of other characteristics of identification may be unnecessarily burdensome. The case may be different if the fees are paid by a mutual or in an insurance system.

When more than one professional work in the same office, two identification columns may be useful: the number of the patient and that of the professional. These give sufficient means of identification without compromising confidentiality.

When dealing with national health insurance systems, each document usually carries sufficient means of identification.

As concerns epidemiological needs, some knowledge concerning the patient shall be recorded. Usually information on sex, year and region of birth will suffice.

When dealing with odonto-vigilance (post-marketing surveillance and evaluation of dental materials), some means of rapid identification of the patient shall be provided. This may include either the full social security number (one large column), or, again, the registration number of the dentist in his or her country, and the identification number of the patient in his or her records. That means two smaller columns, with a better guarantee of confidentiality as

concerns the patient; and provides further information for those materials for which the manner in which they are used is as important as the material itself. A combination of the above may also be convenient: Dentist's registration number plus a significant code number indicating, when useful, the patient sex or year of birth or both.

No recommendation is made on this matter of identification. It is however reasonable to leave a sufficient space, when necessary, to allow for a simple identification, while keeping in mind that the two-column professional-patient system looks both better and safer under many circumstances.

4.2 Column B: Date of intervention

The date of intervention shall be given in descending order: year, month and day (see ISO 8601):

EXAMPLE 15th of May, 1993 is written 1993-05-15.

After about twenty years of experimentation of this system, it has proven to be quite convenient for dental use, in that it is quite practical to place an indication of the year first. However, as the required space was still a little too much, it was decided, and proved practical, to abbreviate this formula to only six digits: two for each of the recorded indications:

EXAMPLE 15th of May, 1993 is written 930515.

For those requiring the time of day to be specified, two supplementary digits can be added with the number of the hour on the 24-h clock.

The standard codification of date, for dental use, is a six-digit column, composed of three double digits giving year, month and day in descending order [to be displayed as the first column in most cases, or the third, when the patient's and/or professional's identification(s) is given elsewhere].

4.3 Column C: Tooth or area of the oral cavity

Standard codification, as approved by WHO, FDI and ISO/TC 106, shall be in one double-digit column (see ISO 3950).

However, it has been brought to our attention that a further digit should be available for epidemiological research in some countries having, for instance, a high prevalence of supernumerary teeth. In view of this, an "Ø", optional, reserved-assignment digit, can be considered valid in some situations. (See the note, in OSI index codes for procedures, in annex A.)

4.4 Column D: Status and procedures

As in OSI index codes for procedures (annex A).

4.5 Column E: Procedure specification

As in OSI index codes for procedures specification and steps (annex B).

4.6 Column F: Procedure step

As in OSI index codes for procedures specification and steps (annex B).

Annex A
(normative)

Oral status and interventions (OSI Index)

Basic decimal principle:

0	HEALTH	HANDICAP/DEPENDENCE					-1			
ORAL STATUS (e.g. intervention needed):										
Assess/Record	Instruction	Surface and support care		Tooth-restoration	Removal	Hard and soft tissue replacement				
-0	-1	-2	-3	-4	-5	-6	-7	-8	-9	See ICD
DECIMAL CLASSIFICATION OF PROCEDURES (interventions column, 1st digit)										
0	1	2	3	4	5	6	7	8	9	
Exam. and aids to diagnosis	Explan. Exercise	Professional surface care	Orthodont.	Periodont.	Enam/dentin restoration	Endodont.	Surgery	Fixed prosthesis	Removable prosthesis	

CODES FOR PROCEDURES

000	051 Examination/record	200	Professional surface care	400	Periodontics	600	Endodontics	800	Fixed prosthesis
010	General preliminary exam.	210	Exam./Plan/Explain./Prescr.	410	Exam./Plan/Explain./Prescr.	610	Exam./Plan/Explain./Prescr.	810	Exam./Plan/Explain./Prescr.
020		220		420		620	Temporary dressing	820	
030	Microbiological sampling	230	Stain removal	430	Recontour	630	Lining	830	Enamel bonded
040	Bite-wing X-ray	240	Calculus removal, light	440	Root cleaning	640	Capping, indirect	840	Crown tooth cemented
050	X-ray, intra-oral film	250	Calculus removal, heavy	450	Curettage	650	Capping, direct	850	Crown + implant cemented
060	X-ray, extra-oral film	260	Caries preventive applicat.	460	Applied medication	660	Chamber	860	Bone implanted abut. only
070	Biopsy	270	Pits and fissures sealing	470		670	Root-canal(s)	870	
080	Cytological sampling	280		480		680	Root-canal retreatment	880	
090	Not coded:	290	Not coded:	490	Not coded:	690	Not coded:	890	Not coded:
	Description mandatory		Description mandatory		Description mandatory		Description mandatory		Description mandatory
100	Instruct/Exercise/Monitor	300	Orthodontics	500	Single tooth restoration	700	Oral dental surgery	900	Removable prosthesis
110	Exam./Plan/Explain./Prescr.	310	Exam./Plan/Explain./Prescr.	510	Exam./Plan/Explain./Prescr.	710	Exam./Plan/Explain./Prescr.	910	Exam./Plan/Explain./Prescr.
120	General, Oral Health, diet	320	Monitor development	520	Direct insertion, metallic	720	Extraction, tooth	920	Partial, tooth/implant borne
130	Mucosal	330		530	Direct insertion, nonmetallic	730	Access to other procedure	930	Partial, t./i.& mucosa borne
140	Gingival	340	Retainer, removable	540	Direct insertion, metallic, late	740	Trauma, fracture reduct.	940	Partial, mucosa borne
150	Enamel	350	Retainer, fixed	550	Direct insertion, nonmetallic, late	750	Lesion, foreign body, etc.	950	Full denture, roots/m, borne
160	Force/position control	360	Positioner, removable	560	Direct insert. Extended/repai	760	Tumour	960	Full denture, implants attached
170	Pain relief/desensitizat.	370	Positioner, fixed	570	Laboratory preform	770	Cosmet/funct. rest/maint.	970	Full denture, mucosa-borne
180		380	Not yet assigned	580	Factory preform	780	Pain/control procedure	980	
190	Not coded:	390	Not coded:	590	Not coded:	790	Not coded:	990	Not coded:
	Description mandatory		Description mandatory		Description mandatory		Description mandatory		Description mandatory

NOTE Ø, as third digit, represents a **reserved-assignment, specific, optional code**: It may be assigned a meaning, and accordingly replaced by the convenient digit, by, in order of precedence, WHO, FDI, their regional organizations, ISO/TC 106, international or national responsible authorities, permanently or for a given period of time, in part or in toto, according to the identified need or needs. Non-assigned digits may be used on a local or regional basis, in schools or centres, or in private organizations or offices, to meet the special needs of the user. As a rule, optional code assignments should not conflict with those in the specifications column.

Annex B (informative)

Codes for tooth-surface sites, laboratory steps, materials, and one-appointment steps

B.1 Tooth-surface site codes for 50Ø (code column E)

NOTE Except for "P" (pulp-space retention, or post), all abbreviations used for explaining the codes' meaning are those recommended by the FDI, in conformity with ISO 3950. Although not displayed here, an optional third digit may be used to meet specific needs. The multiplication of root surface caries might make it statistically useful.

10: 1 surf.	20: 2 surf.	30: 3 surf.	40: 4 surf.	50: 5 surf.	60: All surf. + Post
11: O	21: OM	31: OMD	41: OMDV/OMDL	51: OMDVL	61: OMDVLP
12: M	22: OD	32: OMV	42: OMVL/ODVL	52: OMDVP	62: Post core
13: D	23: OV	33: OML	43: MDVL	53: OMDLP	63: Full post crown
14: V	24: OL	34: ODV	44: OMDP	54: OMVLP	64: Post attachment
15: L	25: MV	35: ODL	45: OMLP/OMVP	55: ODVLP	65: *
16: G(M)	26: DV	36: OVL	46: ODVP/ODPL	56: Full crown	66: *
17: G(D)	27: ML	37: MVD/MLD	47: OVLP	57: *	67: *
18: G(V)	28: DL	38: VML	48: *	58: *	68: *
19: G(L)	29: *	39: VDL	49: *	59: *	69: *

(*) Not assigned yet.

B.2 Codes for laboratory steps (code column F)

- 70 Any laboratory step
- 71 Working or study model
- 72 Pattern for occlusion registration
- 73 Assembly – preforms – teeth
- 74 Assembly – preforms – wire/metal
- 75 Pattern investment
- 76 Final form
- 77 *
- 78 *
- 79 Not coded: information attached

B.3 Materials codes for 30Ø, 57Ø, 58Ø, 80Ø, 90Ø (code columns E or F)

- 80 Any factory- or custom-formed material
- 81 Metal
- 82 Polymer
- 83 Ceramic or cast glass
- 84 Metal + polymer
- 85 Metal + ceramic
- 86 Metal ceramic system
- 87 Polymer + ceramic
- 88 Metal + polymer + ceramic
- 89 Not coded: information attached

B.4 One-appointment steps for 30Ø, 57Ø, 58Ø, 80Ø, 90Ø (code column F)

- 90 Any one-appointment step
- 91 Preparation
- 92 Preparation and/or impression
- 93 Preparation, impression and/or registration of occlusion and appearance
- 94 Insertion
- 95 Final seal or attachment
- 96 Contour check/recontour
- 97 Repair
- 98 Rebase
- 99 Removal

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