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Dentistry — Working space of the dentist — Definitions and principles

Art dentaire — Poste de travail du praticien — Définitions et principes

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FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3246 was drawn up by Technical Committee ISO/TC 106, *Dentistry*, and was circulated to the Member Bodies in June 1975.

It has been approved by the Member Bodies of the following countries :

Belgium	Italy	Switzerland
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The Member Body of the following country expressed disapproval of the document :

United Kingdom

Dentistry — Working space of the dentist — Definitions and principles

0 INTRODUCTION

The study of the working space of the dentist and his auxiliary personnel refers to the arrangement and the use of dental equipment in the operatory. The purpose of this study should be to base dental treatment on ergonomic principles, with special reference to the potential use of the dental equipment. However, in addition to the equipment, other factors, such as colours, lighting, noise insulation and air conditioning, should also be taken into consideration.

1 SCOPE AND FIELD OF APPLICATION

This International Standard lays down definitions and principles relating to the working space of the dentist operating in a single treatment unit.

2 DEFINITIONS

2.1 working space : The space organized and equipped for the execution of a task.

2.2 rationalization : The scientific organization of human effort in order to ensure, by the standardization of methods the minimum waste of labour with consequent maximum reward for the effort expended.

2.3 ergonomics : The study of man in relation to his working environment.

In the field of dentistry, this definition can be extended in the following way : "the economical use of human potential by adapting the working conditions to the physical and mental capacities of the individuals under consideration".

2.4 correct working posture : The posture which avoids prolonged periods of static muscular activity and which allows the relaxation of the muscles which are not necessary for maintaining the posture.

3 PRINCIPLES

The evaluation of the working space of the dentist is based on the following principles :

a) rationalization in dentistry;

b) application of ergonomic principles, taking into account the anthropometric variations of the human being, for example whether he be right-handed or left-handed;

c) consideration of the different working postures possible, of the various concepts of the work as well as of their evolution;

d) the importance attached to environmental factors, not unconnected with the various elements making up the professional equipment of the working space.

4 UNITS

The dimensions are expressed in centimetres and the angles in degrees.

5 STANDARDIZED CONVENTIONAL DATA

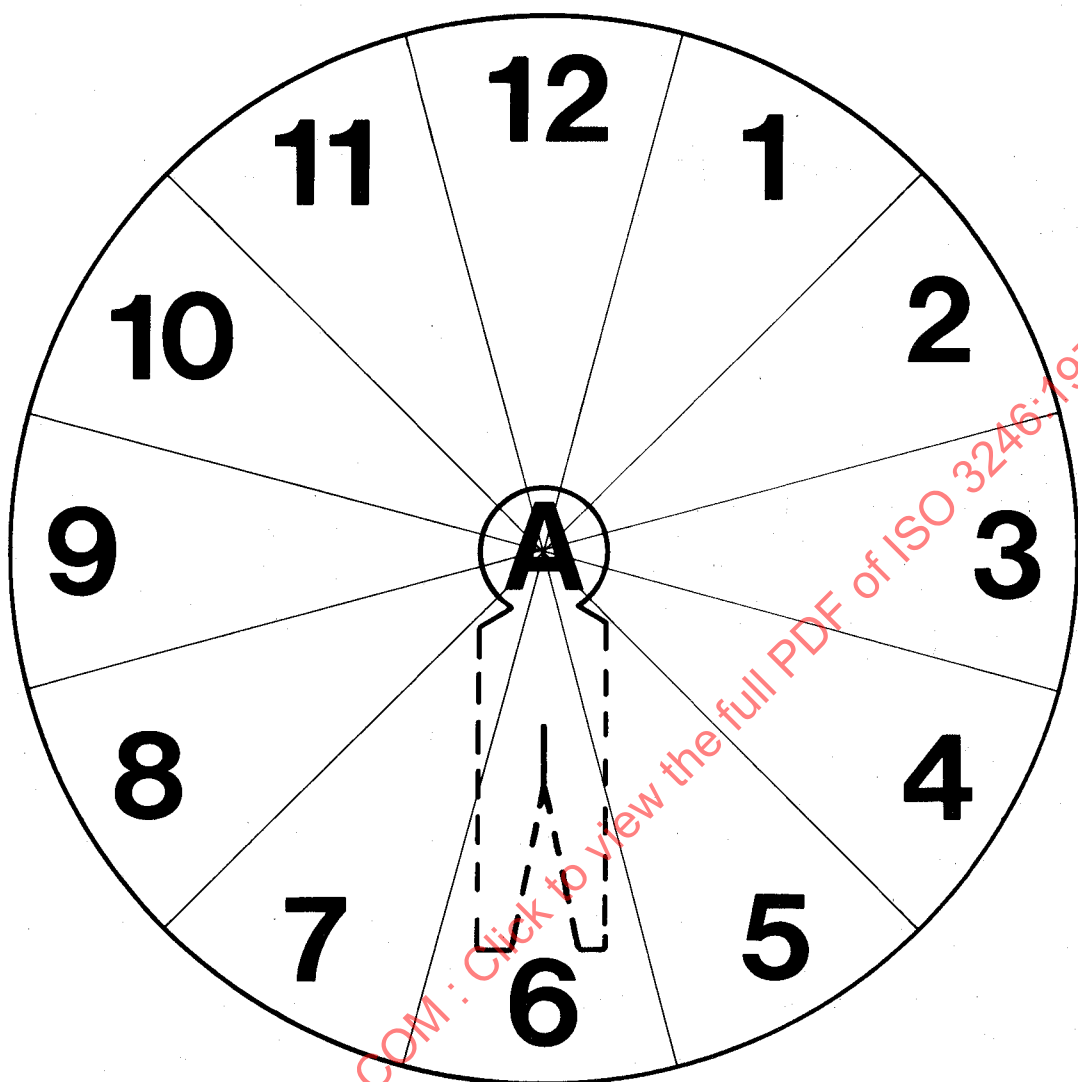
In order to facilitate exchange of information and comparisons between different opinions and practices, it is necessary first to adopt a number of standardized conventions by means of which it will, in particular, be possible to define unambiguously in all cases the relative positions of the patient, the dentist and his operating and non-operating assistants, to compare and judge the characteristics of the various elements making up the working space and to study their arrangement.

The standardized conventions indicated in 5.1 to 5.4 do not represent a choice between several methods or a choice between several positions; they aim at creating a common language allowing things to be expressed in a comprehensible way.

5.1 Reference plan (See page 2)

In the horizontal projection on the diagrammatic representation of a dial-plate graduated from 1 to 12, the reference position of the patient is 6A, A being the centre of the reference dial-plate with the head of the patient at point A and his feet at 6.

Using this means of reference, it is possible to define the sectors occupied around the patient by the dentist, the operating assistant and the various elements of the working place, by one or two numbers between 1 and 12.



REFERENCE PLAN

5.2 Determination of the height of a patient's chair in the sitting position

For a chair fitted with a back, the point of reference used for the measurement of the height of the chair above the ground is taken 13 cm forward of the intersection of the plane of the back of the chair with the seat. The measurement is taken in the sitting position after a suitably shaped mass¹⁾ has been positioned so as to compress the upholstery in a realistic way.

5.3 Classification of movements

Each movement is defined and interpreted according to the following classification which is based on the anatomical part moved or the part around which movement takes place.

Class	Upper limb	Lower limb	Head	Vertebral column
1	the fingers	the toes	eyes	
2	the wrist	the ankle	neck	vertebrae, for example S1, L5, C7, D1 etc.
3	the elbow	the knee		
4	the shoulder	the hip		
5				complete column

1) A mass of 50 kg is generally recommended. It should be made up of several lead sections in a plastic case to facilitate manipulation.

5.4 Working postures of the dentist and the assistant

The dentist and the assistant can obtain a good working posture :

- by avoiding fatigue of the lower limbs and the pelvis by sitting as much as possible, in particular for all delicate work such as that included in restorative operations, in a position which permits a certain amount of freedom of movement;
- by avoiding twisting and lateral bending of the spine and by limiting the inclination of the latter frontwards, permitting easy movement of the shoulders;
- by restricting movements of the head. These shall be the subject of a special study;
- by being positioned in such a way that the distance from the eye to the job is correct;

- by keeping the elbow as near as possible to the trunk;

- by keeping, as far as possible, the forearm horizontal and steady;

- by keeping the fingers, the hand and the wrist as relaxed as possible.

With the patient placed in the reference position mentioned in 5.1, the dentist and the assistant may work :

- standing;

- sitting (at 90°), with the thigh making an angle of 90° with the trunk and the lower part of the leg;

- semi-sitting (at 105° and 130°), the dentist's seat being raised so that the thigh makes an angle of 105° with the trunk and 130° with the lower part of the leg.

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