

INTERNATIONAL  
STANDARD

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**Prosthetics and orthotics — Limb deficiencies —**

**Part 1 :**

Method of describing limb deficiencies present  
at birth

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*Prothèses et orthèses — Malformation des membres —*

*Partie 1 : Méthode de description des malformations congénitales des membres*

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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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8548-1 was prepared by Technical Committee ISO/TC 168, *Prosthetics and orthotics*.

ISO 8548 consists of the following parts, under the general title *Prosthetics and orthotics – Limb deficiencies*:

- *Part 1: Method of describing limb deficiencies present at birth*
- *Part 2: Method of describing lower limb amputation stumps*

NOTE – A further part is also in preparation, covering the method of describing upper limb amputation stumps.

Annex A of this part of ISO 8548 is for information only.

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## Introduction

Prior to 1961 there was little or no agreement over the terms used to describe congenital skeletal limb deficiencies. In that year Frantz and O'Rahilly published a classification in the USA which attempted to provide a comprehensive system of nomenclature. At the same time a different system was in use in Europe. Although both systems used terms derived from Greek roots there was little similarity. A revision of the US classification by Burtch in 1966 attempted to bridge the gap, but has been used as a third system rather than as a revised version. In 1969 Henkel and Willert produced a systemization of the German nomenclature based on a progression in the severity of the defect.

Against this background the International Society for Prosthetics and Orthotics formed an international working party in 1973 whose task was to produce a single acceptable classification. Early agreement was reached that this should apply only to those deficiencies which result from a failure of formation of parts, and should describe them in simple anatomical terms avoiding words derived from Greek or Latin roots. This working party (usually known as the Kay Committee after its Chairman, the late Hector Kay) produced such a classification which was tested in a number of centres. In brief, it describes all such deficiencies as either "transverse" or "longitudinal". The former includes all those in which the affected limb has developed proximodistally to a particular level beyond which no skeletal elements exist, and thus the limb resembles an amputation stump. Such deficiencies are described by the level at which the limb terminates. The longitudinal type of deficiency includes all other deficiencies in which one or more bones may be partially or totally absent, and in this case the absent bone(s) are individually named.

Users of this International Standard are also advised of the WHO International Classification of Impairments, Disabilities and Handicaps, published by the World Health Organization, Geneva, 1980.

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# Prosthetics and orthotics — Limb deficiencies —

## Part 1 :

### Method of describing limb deficiencies present at birth

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#### 1 Scope

This part of ISO 8548 establishes a method for describing deficiencies of the upper and lower limbs present at birth.

It describes only those bone deficiencies that are due to a failure of formation of parts, and it does so on anatomical and radiological bases. No attempt has been made to attribute any etiological or epidemiological factors.

#### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8548. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8548 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8549-1 : 1989, *Prosthetics and orthotics — Vocabulary — Part 1: General terms.*

ISO 8549-2 : 1989, *Prosthetics and orthotics — Vocabulary — Part 2: Terms relating to external limb prostheses and wearers of these prostheses.*

#### 3 Definitions

For the purposes of this part of ISO 8548, the definitions given in ISO 8549-1 and ISO 8549-2 apply.

#### 4 Description of deficiencies

##### 4.1 General

Initially describe the deficiency as “transverse” or “longitudinal” and then describe further each type of deficiency as indicated in 4.2 or 4.3 as appropriate. In cases where a patient has deficiencies of more than one limb, describe each deficiency separately.

##### 4.2 Transverse deficiencies

Describe transverse deficiencies as follows:

- State the side (left or right) of the patient affected.
- State the limb (upper or lower) affected.
- State the level of the deficiency as shown in figure 1.

##### 4.3 Longitudinal deficiencies

Describe longitudinal deficiencies as follows and as indicated in figures 2 and 3:

- State the side (left or right) of the patient affected.
- State the limb (upper or lower) affected.
- For the bones of the shoulder and pelvic girdles and the long bones of the limbs, state the name of the bone(s) affected.

For a metacarpal bone, a metatarsal bone and the phalanges, state the number of the digit affected. Number the metacarpals or metatarsals and the corresponding phalanges from the radial and tibial sides respectively and number the "thumb" and "great toe" as "1".

NOTE — When referring collectively to a metacarpal, or a metatarsal, and its corresponding phalanges, the term "ray" may be used.

d) State the extent of deficiency of each bone, progressing from the most proximal bone to the most distal, as follows :

1) Shoulder/pelvic girdles

State which bones are totally absent and which bones are partially absent. In the case of partial deficiencies, identify and state the part of the bone that is absent.

2) Humerus, radius and ulna; femur, tibia and fibula

State which bones are totally absent and which bones are partially absent. In the case of partial deficiencies, state the approximate fraction of the bone that is absent and the position (e.g. proximal, distal) of the deficiency.

3) Carpus; tarsus

State if the carpus or tarsus is totally absent or if it is partially absent (i.e. some carpal or tarsal bones are present).

NOTE — Further description of partial deficiencies by means of naming or enumerating individual bones may be added.

4) Metacarpals; metatarsals

State which bones are totally absent and which bones are partially absent.

NOTE — Further description of partial deficiencies by means of stating the position (i.e. proximal or distal) of the deficiency may be added.

5) Phalanges

State which phalanges are totally absent and which phalanges are partially absent.

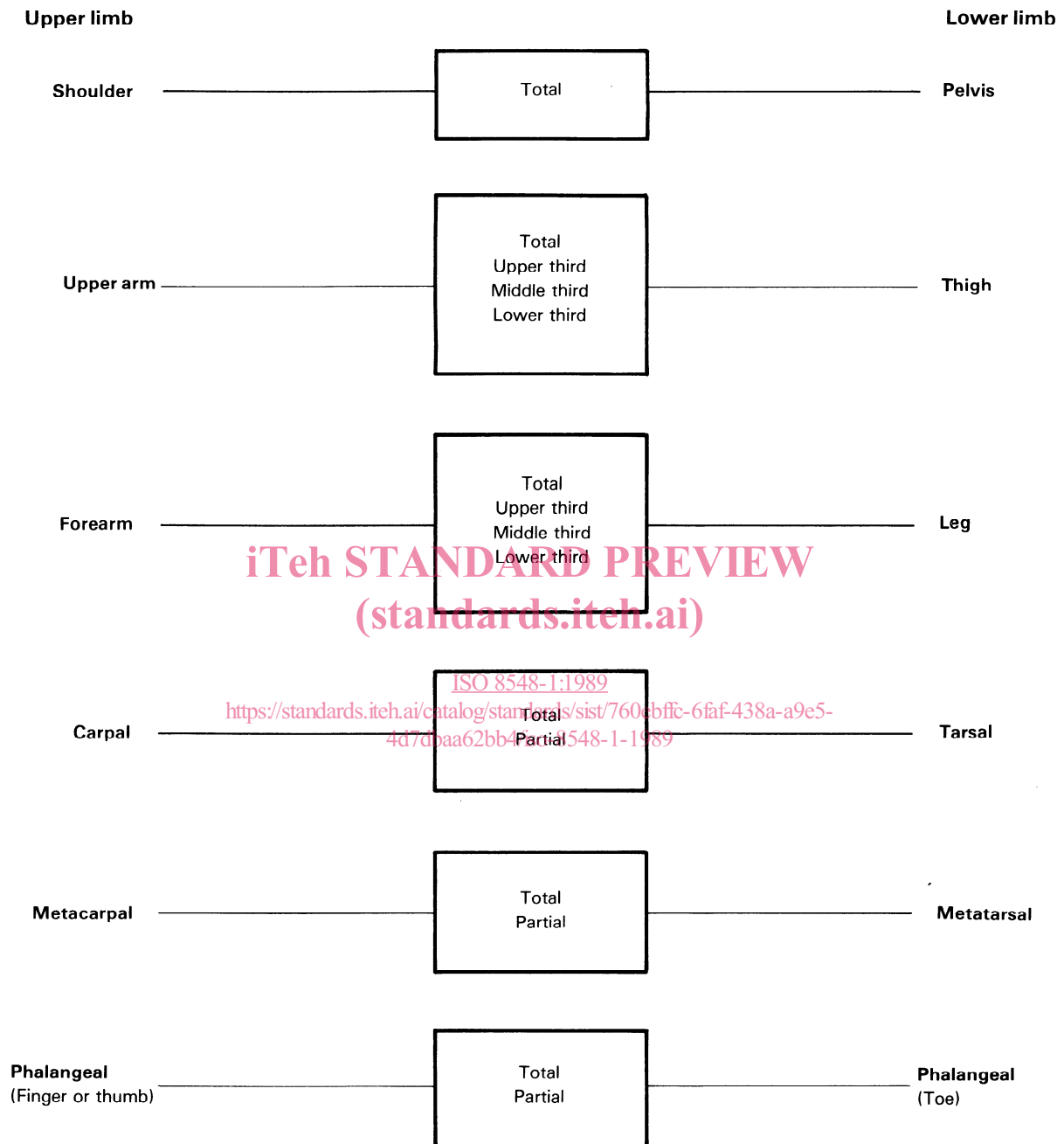
NOTE — Further description of partial deficiencies by means of naming the affected phalanx (i.e. proximal, intermediate or distal) may be added.

e) State the presence of hypoplasia, if appropriate, for any bone that has not been described as either totally absent or partially absent.

NOTE — Examples of various longitudinal deficiencies and their descriptions according to the principles of this Standard are given in annex A. In instances of partial longitudinal deficiencies, more detailed descriptions of the affected bones may be added, but such descriptions do not come within the scope of this part of ISO 8548.

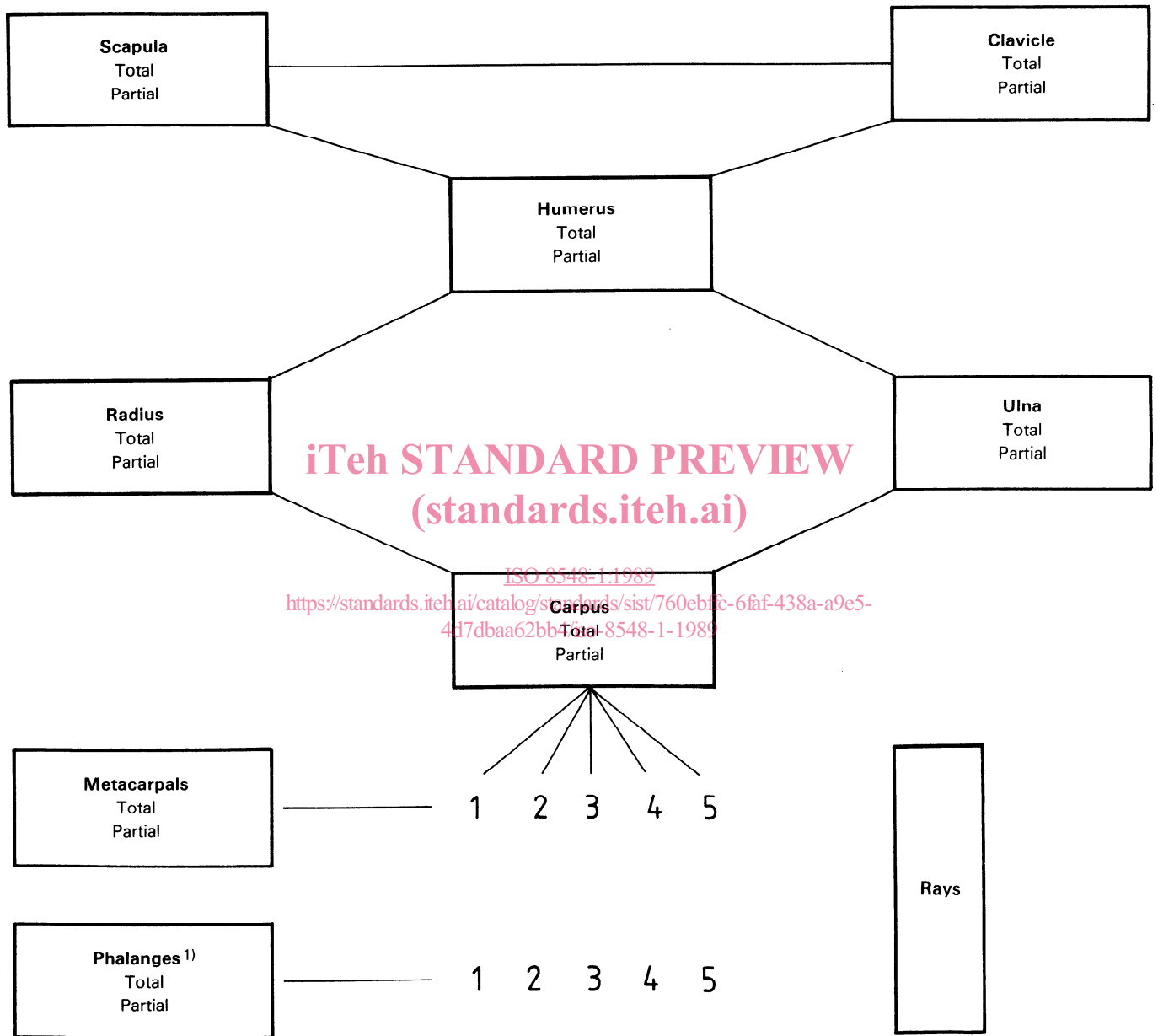
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NOTE — Total absence of the shoulder or hemipelvis (and all distal elements) is a transverse deficiency. If only a portion of the shoulder or hemipelvis is absent, the deficiency is of the longitudinal type.

Figure 1 — Designation of levels of transverse deficiencies of upper and lower limbs



1) The digits of the hand are sometimes referred to by name; that is: 1, thumb; 2, index finger; 3, middle finger; 4, ring finger, and 5, little (or small) finger. This method is deprecated because it is not equally applicable to the foot.

Figure 2 – Description of longitudinal deficiencies of upper limb



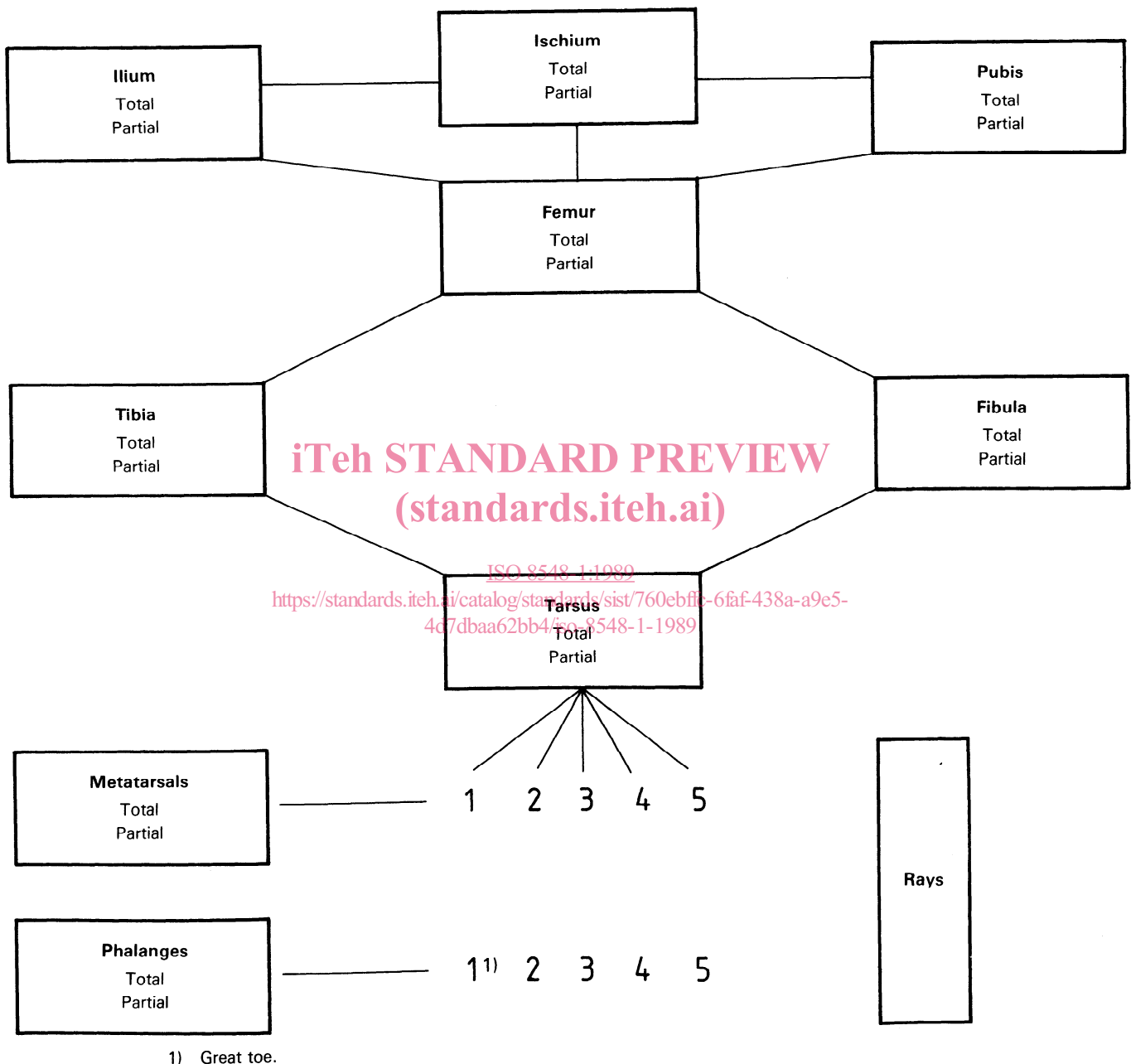


Figure 3 — Description of longitudinal deficiencies of lower limb