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Ophthalmic implants — Intraocular lenses — Part 7: Clinical investigations of intraocular lenses for the correction of aphakia

Implants ophtalmiques — Lentilles intraoculaires — Partie 7: Investigations cliniques de lentilles intraoculaires pour la correction de l'aphakie

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Contents

Foreword

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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 document 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~~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~~www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 7, *Ophthalmic optics and instruments*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 170, *Ophthalmic optics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement)

This fifth edition cancels and replaces the fourth edition (ISO 11979-7:2018), which has been technically revised. The changes related herein for updating the document to the fifth edition apply to devices that will enter the marketplace after the date of publication of the fifth edition and are not designed or meant to limit any devices currently approved and marketed, nor those devices in the process of approval.

The main changes are as follows:

— development of definitions of non-accommodative posterior chamber “Simultaneous Vision Range” (SVIOL) lenses that include the subtypes of MIOL (Multifocal), EDF (Extended Depth of Focus) and FVR (Full Visual Range) IOLs, and defining each of these IOL types to allow differentiation among the lens types based on clinical and safety performance measures,

— establishment of guidelines for clinical testing of newly defined IOL types as listed above as well as related novel lens types, with alignment of testing methodologies among the lens types;

— ~~The international standards~~ ISO 11979-1, ISO 11979-2, ISO 11979-4 and ~~the Technical Report~~ ISO/TR 22979 are ~~in~~under revision and, when published, will be aligned with this edition of ISO 11979-7.

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A list of all parts in the ISO 11979 series can be found on the ISO website.

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~~www.iso.org/members.html.

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Introduction

Intraocular lenses (IOLs) are used to correct residual refractive errors in subjects who have aphakia. Such residual refractive errors typically include sphere and astigmatism but may also correct for a lack of accommodation. Different designs of IOLs can be used to correct for specific refractive errors. In the case where an IOL is designed to provide more than one type of refractive correction, that IOL will have to satisfy each of the separate requirements of those correction designs.

This document provides requirements and recommendations for intraocular lens investigations of new IOL models. In the case where an IOL model is a modification of a parent IOL model, a risk analysis can be used in order to determine the appropriate level of testing.

Ophthalmic implants — Intraocular lenses — Part 7: Clinical investigations of intraocular lenses for the correction of aphakia

1 Scope

This document specifies the particular requirements for the clinical investigations of intraocular lenses that are implanted in the eye in order to correct aphakia.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

~~<std>~~ISO 11979-1, *Ophthalmic implants — Intraocular lenses — Part 1: Vocabulary*~~</std>~~

~~<std>~~ISO 11979-10, *Ophthalmic implants — Intraocular lenses — Part 10: Clinical investigations of intraocular lenses for correction of ametropia in phakic eyes*~~</std>~~

~~<std>~~ISO 14155, *Clinical investigation of medical devices for human subjects — Good clinical practice*~~</std>~~

~~<std>~~ISO 14971, *Medical devices — Application of risk management to medical devices*~~</std>~~

3 Terms and definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11979-1 and ISO 14155 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~~https://www.iso.org/obp

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

3.2 Abbreviated terms

UDVA	uncorrected distance visual acuity
UIVA	uncorrected intermediate visual acuity
UNVA	uncorrected near visual acuity
CDVA	corrected distance visual acuity
CS	contrast sensitivity
CNVA	corrected near visual acuity
DCIVA	distance corrected intermediate visual acuity

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DCNVA distance corrected near visual acuity

4 Justification for a clinical investigation

A risk analysis shall be implemented in accordance with ISO 14971. If the risk analysis identifies the need for a clinical investigation, the requirements of ISO 14155 shall apply, with additional requirements given in this document.

If a new IOL model is a modification of a parent IOL for which the safety and performance have already been established through clinical investigation in accordance with this document, then a limited or no additional clinical investigation shall suffice.

ISO/TR 22979[2] provides guidance in determining the need for a clinical investigation. The outcomes of optical evaluation performed according to in ISO 11979-2[1] can be used to include or exclude characteristics to be studied in a clinical investigation.

5 Ethical considerations

For clinical investigations of medical devices for human subjects, the ethical requirements in ISO 14155 apply.

6 General requirements

6.1 General

There are four main categories of intraocular lenses that are determined by optical design and/or clinical characteristics or performance:

a) monofocal (IOL);

b) toric (TIOL);

c) simultaneous vision lens (SVIOL): non accommodative lenses of three sub-categories that provide simultaneous vision at multiple distances with EDF and FVR IOLs classified as non-inferior to monofocal lenses at far:

— multifocal (MIOL); lens implants that emphasize optical and functionally useful acuity levels at far, but when compared to the monofocal control lens, also have improved optical and clinical performances at near focal distances. Multifocal lenses (MIOLs) have additional requirements for near vision;

— extended depth of focus (EDF IOL); lens implants that emphasize optical and functionally useful acuity levels at far but also from far through intermediate focal distances. Extended depth of focus lenses (EDF IOLs) have additional requirements for intermediate vision;

— full visual range IOL (FVR IOL) lens implants that emphasize optical and functionally useful acuity levels at far but also from far through intermediate and up to near focal distances. Full visual range lenses (FVR IOLs) have additional requirements at intermediate and near vision

d) Accommodating (AIOL).

The same basic requirements apply to all of the IOL types. Additional requirements apply to SVIOL, EDF, TIOL, and AIOL lenses.

There is a further subdivision depending on anatomic placement of the IOL:

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