

Contact Lens Update

CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Defining and Classifying Myopia: A Proposed Set of Standards for Clinical and Epidemiological Studies

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Flitcroft DI et al. Defining and Classifying Myopia: A Proposed Set of Standards for Clinical and Epidemiologic Studies. Invest Ophthalmol Vis Sci. 2019 Feb 28;60(3):M20-M30.

This committee was led by Ian Flitcroft. The group applied a consensus and evidence-based approach to develop standardised terminology, and to propose definitions of myopia, its thresholds and ocular complications.

When deciding on specific wording and threshold values, the committee considered several criteria to ensure final wording remained relevant to researchers, was appropriate for use in clinical research, helpful in describing the underlying biology of myopia and applicable to the development of public health policy.

It was recognised that historically a wide range of terms have been used to describe and categorise myopia. The report recommends consolidation of these definitions into the following categories: myopia, secondary myopia, axial myopia, and refractive myopia. Relevant for research purposes, a category of pre-myopia was also suggested, along with definitions of low and high myopia. These are summarised in Table 1 below, which has been adapted from the report:

Table 1: Summary of Proposed General and Quantitative Thresholds for Myopia

TERM	DEFINITION
QUALITATIVE DEFINITIONS	
Myopia	A refractive error in which rays of light entering the eye parallel to the optic axis are brought to a focus in front of the retina when ocular accommodation is relaxed. This usually results from the eyeball being too long from front to back, but can be caused by an overly curved cornea and/or a lens with increased optical power. It also is called nearsightedness.
Axial myopia	A myopic refractive state primarily resulting from a greater than normal axial length.
Refractive myopia	A myopic refractive state that can be attributed to changes in the structure or location of the image forming structures of the eye, i.e. the cornea and lens.
Secondary myopia	A myopic refractive state for which a single, specific cause (e.g. corneal disease or systemic clinical syndrome) can be identified that is not a recognized population risk factor for myopia development.
QUANTITATIVE DEFINITIONS	
Myopia	A condition in which the spherical equivalent refractive error of an eye is ≤ -0.50 D when ocular accommodation is relaxed.
Low myopia	A condition in which the spherical equivalent refractive error of an eye is ≤ -0.50 and > -6.00 D when ocular accommodation is relaxed.
High myopia	A condition in which the spherical equivalent refractive error of an eye is ≤ -6.00 D when ocular accommodation is relaxed.
Pre-myopia	A refractive state of an eye of $\leq +0.75$ D and > -0.50 D in children where a combination of baseline refraction, age, and other quantifiable risk factors provide a sufficient likelihood of the future development of myopia to merit preventative interventions

Myopia, and especially higher degrees of myopia are associated with structural changes within the eye. These changes are sometimes termed ‘degenerative high myopia’. The committee proposes using ‘pathologic myopia’ instead.

Pathologic myopia is defined as: excessive axial elongation associated with myopia that leads to structural changes in the posterior segment of the eye (including posterior staphyloma, myopic maculopathy, and high myopia-associated optic neuropathy) that can lead to loss of best corrected visual acuity.

It was noted that inclusion of any value of refraction or axial length is unhelpful in this definition, because while pathologic myopia may be more commonly associated with high myopia, it is not exclusively so. The report also defines myopic macular degeneration, and a number of subdivisions of this pathology: myopic maculopathy, presumed myopia macular degeneration, myopic traction maculopathy and myopia-associated glaucoma-like optic neuropathy.

Overall, the report authors recognise the need for standardised definitions and use of consistent thresholds in the field of myopia management research and practice. Their hope is the proposed definitions are adopted, or at the very least, provide a starting point for wider discussion, derivation and development of a meaningful consensus.