

Atropine for Myopia Management

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Atropine eye drops are used to dilate (open) the pupils and fully relax the focusing power (accommodation) of the eye (i.e. cycloplegia) and has been used for myopia control for some years.

Studies have shown its effectiveness in a concentration-dependent response. While varying strengths (0.05%, 0.025%, and 0.01%) atropine eye drops reduced myopia progression, 0.05% atropine was most effective in controlling myopia progression and eye elongation.^{xix} Particular attention must be paid to higher concentrations of atropine due to it being a nonselective muscarinic antagonist. Patients/parents must be made aware of the off-label use of these drugs, as well as all possible side effects. Spectacles, whether in distance, near, bifocal or progressive design, have not been shown to be clinically effective in the management of progressive myopia.^{xx}

In summary, all health care professionals, teachers, school nurses, legislators, public health officials and especially parents need to be keenly aware of the environmental and genetic challenges our youth faces today, including the near epidemic rise of myopia and myopia related ocular disease. Regular in-person comprehensive dilated and cycloplegic eye examinations by an eye doctor are necessary for all children between the age of 6 months to 12 months and between age 3 and age 5. The specific timeline of eye examination for children and adolescents has been detailed in the American Optometric Association Evidence Based Clinical Practice Guideline on the Comprehensive Pediatric Eye and Vision Examination. ^{xxi} From a public health perspective, the economic burden of undiagnosed myopia and related vision loss is massive. Intervention at an earlier age can likely prevent the worsening of myopia and myopia related vision loss. Doctors of optometry are extensively trained both didactically and clinically in pediatric (infant, Page | 4 May 2019 toddler and children's) eye care to be uniquely qualified to manage myopia and related eye and vision health concerns.^{xxii} As such, interprofessional referrals from pediatricians, nurses, behavioral/mental health and other health care providers (who assist the identification of vision problems) to doctors of optometry, should be common.

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x-<https://apps.who.int/iris/bitstream/handle/10665/311664/9789241550536-eng.pdf?sequence=1&isAllowed=y>

xi-Xiong S, Sankaridurg P, Naduvilath T, Zang J, Zou H, Zhu J, Lv M, He X, Xu X. Time spent in outdoor activities in relation to myopia prevention and control: a meta-analysis and systematic review. *Acta Ophthalmol.* 2017 Sep;95(6):551-566. doi: 10.1111/aos.13403. Epub 2017 Mar 2. Review. PubMed PMID: 28251836; PubMed Central PMCID: PMC5599950.

xii-<https://www.cbsnews.com/news/whats-behind-the-rise-in-nearsightedness/>

xiii-Sherwin JC, Reacher MH, Keogh RH, Khawaja AP, Mackey DA, Foster PJ. The association between time spent outdoors and myopia in children and adolescents.