

What Are OMD's Saying?

Paul Alan Harris, OD

Fellow College of Optometrists in Vision Development
Fellow Australasian College of Behavioral Optometry
Fellow American Academy of Optometry

Binocular Vision & Strabismus Quarterly Second Quarter of 2000 volume 15 (No.2) Editorial

Guest Editorial: Amblyopia: Its Treatment Today
and Its Portent for the Future by John T. Flynn,
MD.

Amblyopia occurs during the process of visual development which is an active, monocular and binocular process lasting until early teen years when Vernier and other types of very precise and high level acuity thresholds (the so called hyper-acuities) finally reach adult levels.

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Treatment of amblyopia has basically not changed since occlusion therapy of the sound eye was introduced in Europe during the mid-eighteen (sic) century. While this might seem to suggest that the therapy is completely satisfactory and therefore requires no critical analysis, familiarity with its use in the clinic suggests otherwise. In addition, recent prevalence studies report that amblyopia remains a very common cause of monocular vision loss, ranking among the top three causes in adults up to the age of 65 years, mute testimony to the persistence of the defect throughout life.

**Binocular Vision & Strabismus Quarterly
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“What is the outcome of occlusion of the dominant eye on the vision of the non-dominant eye?”

When one pools the raw data of many published series since 1960, the answer emerges that approximately 75% of amblyopic patients are successful on the first episode of occlusion therapy, success is here defined, as it is in most studies, as a visual acuity of 20/40 or better. Naturally, the outcomes are not the same for all three types of amblyopia. Strabismic is best (78%), then Anisometropic (67%) and Strabismic Anisometropic is poorest at (59%).

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The next question asked was, “After successful occlusion, at what rate does that vision achieved by arduous effort by the child and the parents decline?”

Using the type of analysis developed for plotting cancer survival, it turns out that 73% of successfully treated amblyopes maintain vision for one year, 61% for two years, and 54% for three years.

**Binocular Vision & Strabismus Quarterly
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Amblyopia remains a significant cause of preventable monocular visual loss in children which persists into adulthood. Indeed, this prevalence in the adult population has led some observers to question the value of childhood visual screening for amblyogenic defects if the results seem to indicate the persistence of the disorder in the older age group.

**Binocular Vision & Strabismus Quarterly
Second Quarter of 2000 volume 15 (No.2) Editorial**

P.E. Romano, MD Editorial on Surgery for Accommodative Esotropia.

This editorial begins as a commentary on two different approaches to the treatment on accommodative esotropia. As it goes on it becomes a vehicle for the editor to comment on the secondary iatrogenic effects of the North American ophthalmologic approach to using so much plus.

**Binocular Vision & Strabismus Quarterly
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P.E. Romano, MD Editorial on Surgery for Accommodative Esotropia.

Surgery for residual esotropia was required in 15% and an additional 3% required surgery for late decompensation. Mean cycloplegic refraction per eye increased from +3.0 to +6.3 diopters between 1 and 2 years of age and thereafter remained stable between +6.0 and +6.4 up the early teenage years with no reduction. They hypothesize that full cycloplegic spectacle correction of the hyperopia may interfere with the emmetropization of the eye.

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There seems no doubt now that this is the case. There are now a number of reports attesting to this very undesirable state of affairs. We need to do something here. It is one thing to not aggressively treat school myopia. It is a much graver sin to interfere with a normal life process, namely emmetropization, creating in these children permanent hyperopia, a permanent need for optical correction which might not otherwise have been necessary, and a permanent esotropia requiring optical correction which means the patient is permanently esotropic whenever they take their glasses off; and later in life a possibility for premature presbyopia.

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He reports on a study done by Edward Cheeseman Jr. MD and Elba M. Pacheco, MD:

...proposed in their poster using the Reichert distance vectographic suppression test to determine the amount one can safely reduce a hyperopic spectacle correction among accommodative esotropes. They were able to reduce the power of the spectacles by an average of 0.75 D by this method, reducing the power 0.5 D to 1.00 D each visit, stopping just short of where the patient's suppression on the vectograph was becoming worse. Their minimum follow up of 6 months with no loss of control or increase in vectographic suppression was impressive, but they were able to reduce the power of the glasses only 0.50 to 1.25D.

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P.E. Romano, MD Editorial on Surgery for Accommodative Esotropia.

Remember Job #1: DO NO HARM. Well, we are doing harm here. We need to find a way to keep their eyes straight while allowing emmetropization to occur. The following is a small step in the right direction, but only a very small step towards that goal.

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Finally in the same issue appeared a two-page summary by Evelyn Paysse, MD on the Report of the 15th Annual Cullen course, Pediatric Ophthalmology [and Strabismus] Section Baylor College of Medicine, Houston, Texas, March 3-5, 2000. One of the papers was entitled: **Dyslexia: Do's and Don'ts** Romano comments, "However, the signs and symptoms of dyslexia may be mimicked by ophthalmologic abnormalities such as deficiencies of fusion convergence or accommodation, etc."

Binocular Vision & Strabismus Quarterly: First Quarter of 2001 Volume 16 (No.1)

Abnormal Emmetropization In Infants With Partial Spectacle Correction for Hyperopia. Atkinson J, Anker S, Bobler W et al. (*Invest Ophthalmol Vis Sci* 2000; 41:3726-3731)

Purpose: The development of emmetropic refraction is known to be under visual control. Does partial spectacle correction of infants' refractive errors, which has been shown to have beneficial effects in reducing strabismus and amblyopia, impede emmetropization? The purpose of the present study was to perform the first longitudinal controlled trial to investigate this question in human subjects.

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Methods: Children identified as having significant hyperopia [at least one meridian $+3.50D$] in a population screening program at age 8 to 9 months were assigned to treated (partial spectacle correction [$= 1 D$. less than the least hyperopic meridian]) or untreated groups. A control group of infants with no significant refractive errors at screening was also recruited. Measurements of retinoscopic refraction under cycloplegia were taken at 4 to 6 month intervals up to the age of 36 months, and changes in refraction of 148 subjects were analyzed longitudinally.

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Results: Refractive error decreased toward low hyperopic values between 9 and 36 months in both hyperopic groups. By 36 months, this reduction of hyperopia showed no overall difference between children who were treated with partial spectacle correction and those who were not. Despite the improvement, both hyperopic groups' mean refractive error at 36 months remained higher than that of the control group. When infants in all three groups were considered together, the rate of reduction of refractive error was, on average, a linear function of the initial level of hyperopia.

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Conclusions: The benefits of partial spectacle correction for infants with hyperopia can be achieved without impairing the normal developmental regulation of refraction.

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Detecting Children Who Will Benefit from Treatment in an Orthoptic Clinic for Specific Learning Difficulties. McNamara R. (Brit Orthoptic J 1999; 56:22-30)

This article reported a prospective study to determine which orthoptic tests would correctly identify children who would benefit from treatment for a specific learning disability. The cover test, base in fusion range, eye tracking test and the Wilkin's rate of reading were statistically significant between the treated and untreated groups.

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Monocular Occlusion Can Improve Binocular Control and Reading In Dyslexics. Stain JF, Richardson AJ, Fowler MS. (Brain 2000; 123:164-170)

Poor control of eye movement may lead to unstable binocular fixation, and hence unsteady vision; this could possible explain why many dyslexics report that letters appear to move around, causing visual confusion.

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Significantly more of the children who were given occlusion gained stable binocular fixation in the first 3 months (59%) compared with children given the unoccluded glasses (36%). Furthermore, at all the 3-month follow-ups, children were more likely to have gained stable binocular control if they had been wearing the occluded glasses.

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Burton Kushner, MD Archives Ophthalmology in 1999 entitled, "Does Overcorrecting Minus Lens Therapy for Intermittent Exotropia Cause Myopia?" He states: Many studies (summarized in my paper) have found that the myopic shift (loss of hyperopia or increase in myopia) per year is related to the refractive error at the time in question. Specifically, hyperopic children lose approximately +0.15 D of hyperopia per year between 6 and 15 years of age, whereas myopic children show an increase in myopia of approximately -0.50 D per year.

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Children who start out hyperopic and then become myopic show an interesting phenomenon. While they are hyperopic they lose plus at the slower rate of 0.15 D per year. Once they become myopic, they accelerate and gain minus at the higher rate of -0.50 D per year.

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We live in a LASIK-happy society, and spectacles may now be less acceptable than they were in the past. This does not mean that we should replace spectacles with a treatment modality that may be temporarily more pleasing to parents, but has such a high risk of causing infinitely more serious problems a few years down the road.

Binocular Vision & Strabismus Quarterly: Fourth Quarter of 2000 Volume 15 (No.4)

Association for Research in Vision and Ophthalmology in Florida, April 30 – May 5, 2000 and reported on by Paul E. Romano, MD.

Poster 679-B54, **Truong, Cottrial, McBrien:**
Expression of Muscarinic Receptors in Tree Shrew Ocular Tissues: *Conclusion: This study... is the first to report the presence of muscarinic receptor mRNA in the mammalian sclera. Together, the finding of the m1 subtype in the sclera, as well as the ciliary body, retina and choroid demonstrate that muscarinic antagonists [atropine] could act directly on any of these tissues in preventing myopic eye growth.*

Binocular Vision & Strabismus Quarterly: Fourth Quarter of 2000 Volume 15 (No.4)

Association for Research in Vision and Ophthalmology in Florida, April 30 – May 5, 2000 and reported on by Paul E. Romano, MD.

Poster 698-B73, **Winawer, Zhu, Park, Wallman** reported that in chicks, blurring vision with plus lenses for as little as 2 minutes every 2 hours, with normal viewing the rest of the time, changes in refractive error or vitreous chamber depth occurred *suggesting a particular potency of myopic blur to change the growth of chick eye.*

Binocular Vision & Strabismus Quarterly: Fourth Quarter of 2000 Volume 15 (No.4)

Association for Research in Vision and Ophthalmology in Florida, April 30 – May 5, 2000 and reported on by Paul E. Romano, MD.

Poster 3742-B840 **Lozma, Kjorpes, Movshon: Contour Integration in Amblyopic Monkeys:** *... is impaired compared to normal. In most cases the fellow eye is also poorer than normal.*

Binocular Vision & Strabismus Quarterly: Fourth Quarter of 2000 Volume 15 (No.4)

Association for Research in Vision and Ophthalmology in Florida, April 30 – May 5, 2000 and reported on by Paul E. Romano, MD.

Poster 3749-B847: **Ridder III and Rouse, Can Sweep VEP's Predict Post-Amblyopia Therapy Snellen Acuity?; Answer: YES, it is a good predictor.**

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David Coats on the joint meeting of the **European Strabismological Association** and the **Sociedad Española De Estrabología**, which was held in Barcelona Spain in September 2000.

M. Clarke, Ch. Wrigth, J. Henderson, S. Richardson, J. Anderson and the Amblyopia Treatment Trial Group from the United Kingdom presented preliminary information and reviewed the study design for a large multi-center study designed to test the benefits of early screening and treatment of amblyopia. *They cited a paucity of controlled trials as the driving force behind their study. The purpose of the study is to determine if amblyopia treatment is effective.*

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In a report on the Year 2000 meeting of the Texas Society for Pediatric Ophthalmology, reported by James Mims III, MD help September 23, 2000 in Austin, TX, David Dries, MD report on **Long Term Amblyopia Treatment Outcomes.**

He located charts of 85 patients with at least 6 years of follow-up, including 60 strabismic amblyopes, 20 refractive amblyopes, and 5 deprivation amblyopes. Patients in the strabismic and refractive groups both had poor retention of best ever obtained visual acuity when they started with 20/50 or worse initial visual acuity.

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Strabismic amblyopes were much more likely to regress than refractive amblyopes. Amblyopes gained vision, but many lost it during adolescent years, teenage years, and 20's when treated by the general ophthalmologists and resident in this study. Again, the major conclusion was that initial visual acuity of 20/50 or worse predicted poor long-term outcome.

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James Mims III, MD reported on a meeting entitled, "Strabology Report of the 27th Annual Meeting of the American Association for Pediatric and Ophthalmology and Strabismus". The meeting took place March 21-25, 2001 in Orlando Florida.

The most impressive new concepts were presented in the workshop run by Joseph Demer, "Beyond Origins and Insertions: New Concepts of Extraocular Muscles for the Strabismus Surgeon". One of the key new points is that there is elastic connective tissue attached to the posterior surface of the bony orbital rim which acts as a spring under tension pulling the extraocular muscle (EOM) pulleys forward, while the orbital fibers of the EOM are pulling backwards on these same connective tissue springs. When a rectus muscle relaxes, the pulley moves anteriorly, so the angle of approach of the muscle going to the globe stays the same as it is when the rectus muscle contracts.

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This is the long-sought anatomical correlate to Listing's plane. (The eye moves as though it were fixed in a rubber membrane fixed at its equator.) The orbital fibers of the rectus muscles, comprising 40% of the fibers and occupying a crescent shape in cross section on the outward side of the globe fibers, appear to insert on the pulleys and not on the globe directly! These orbital EOM fibers pull in tonic fashion against the connective tissue springs that connect the pulleys with the inner surface of the orbital rim. The pulleys of the rectus muscles translate 8 mm forward and backward as the eye changes from right to left gaze. This keeps the EOM pulleys as far posterior to the axis of rotation as the muscle insertions are anterior to the axis of rotation.

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*At times we get requests from patients to give them some idea of how successful surgery is. Argentina's Alberto O. Ciancia, MD presented on 4 or more years of follow-up on 390 children with infantile esotropia. Esotropia recurred and increased postop from 8% immediately after surgery to 27% four years later. Consecutive exotropia was 8% four years postop. For a subgroup of 137 patients with follow-up of 10 to 28 years, 57% had **orthotropia** (10 ET to 10 XT) and 22% has experienced recurrent esotropia and 21% had developed consecutive exotropia.*

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Evelyn Paysee, MD, David Coats, MD and two students looked at attitudes of children toward strabismus.

She and her co-workers observed 34 naïve children through a one-way mirror as they played with orthophoric and strabismic dolls. She found that a negative attitude towards strabismus seems to emerge at approximately six years of age. Whether the child subjects had strabismus themselves and the gender of the child had no influence on their responses to the dolls.

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Sherry Fawcett PhD, et. al. confirmed in 32 adults that after LASIK or PRK performed to produce monovision, stereo acuity and bifoveal fusion tested with Randot and Worth 4-Dot was permanently impaired. {Romano... All?}

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Arlene Drack, MD and Scott Lambert, MD held a workshop on refractive surgery in children. During this workshop about 20 attendees held up their hands when asked if they had seen patients with new strabismus after (emphasis in the original) LASIK! Also, Drack distributed an article from The Wall Street Journal that reminded everyone that experimenting on children brings special ethical dilemmas.

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Is It Mandatory to Treat Amblyopia Prior to Surgery in Esotropia? Dadeyan S, Kamlesh MS (ACTA Ophthalmologica 2001; 79:28-30) 100 patients were looked at to determining whether the presence of amblyopia has any influence on the outcome of motor and sensory success in esotropia. It was interesting to note the success criteria of the surgery stated as, "Motor success (+/- 10 PD of orthophoria)"!

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Results: *There were no significant differences in motor success (84% vs. 75%) and sensory success (55% vs. 50%) whether amblyopia was fully treated or partially treated.*

Conclusion: *It is not mandatory to treat amblyopia prior to surgery, unless it is a case of infantile esotropia with moderate amblyopia and amblyopia therapy is continued postoperatively.*
