Surgically induced astigmatism is less with a temporal than with a superior clear corneal incision.

**Objective:** To evaluate induced refractory change caused by 2.8mm corneal incisions in patients undergoing phacoemulsification, as a function of incision location.

**Design:** Prospective, interventional clinical case series.

**Methods:** 110 patients aged ≥50 years with visually significant cataract scheduled for routine phacoemulsification were enrolled in this study. Patients underwent preoperative evaluation, including keratometry and corneal topography using the Pentacam. Those patients who had baseline astigmatism <0.5 diopters were randomly assigned to have the clear corneal incision placed either temporally, nasally, or superiorly. Those with greater amounts of pre-existing astigmatism underwent surgery either superiorly or nasally, in the steep corneal axis. Patients with oblique astigmatism were excluded. Follow-up evaluation included repetition of the corneal topography measurements, which allowed computation of surgically induced astigmatism in the overall keratometric changes caused by the incision.

**Results:** Temporal corneal incisions created less surgically induced astigmatism than those placed superiorly or nasally. Overall mean degree of surgically induced astigmatism was <0.25 diopters for temporal incisions. Nasal incisions created greater flattening of the cornea, with values falling in the 0.25 to 0.5 diopter range. A slightly greater degree of corneal flattening was seen in the meridian of superiorly placed incisions, with the range falling between 0.25 to 0.75 diopters.

**Conclusions:** Surgically induced astigmatism is least when clear corneal incisions created by a 2.8mm keratome are placed in the temporal meridian.

**Reviewer’s Comments:** Keeping in mind the expected degree of corneal astigmatism created by 2.8mm keratomes will allow surgeons who use this size incision to estimate the effect of the incision itself on the corneal curvature. When patients have pre-existing astigmatism and it is desired to minimize the degree of postoperative astigmatism, performing surgery in the steep meridian can be beneficial. When the steep meridian is horizontal, nasal incisions appear to induce more flattening than those placed temporally. Knowledge of these principles is also useful in the preoperative assessment and surgical decision-making when using toric intraocular lenses. (Reviewer-Scott D. Smith, MD).

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Keywords: Cataract Surgery

Print Tag: Refer to original journal article
Toric IOL More Effective than Opposite Clear Corneal Incisions in Astigmatism Tx

Toric Intraocular Lens Versus Opposite Clear Corneal Incisions to Correct Astigmatism in Eyes Having Cataract Surgery.
Mendicute J, Irigoyen C, et al:

A greater degree of astigmatic correction can be achieved with toric intraocular lenses in comparison to opposite clear corneal incisions following cataract surgery.

**Purpose:** To compare toric intraocular lens (IOL) implantation and paired opposite clear corneal incisions with regard to correction of preoperative corneal astigmatism in patients undergoing phacoemulsification.

**Design:** Prospective, randomized, controlled clinical trial.

**Methods:** 40 eyes of 40 patients with pre-existing corneal astigmatism between 1 and 3 diopters who had visually significant cataracts and were scheduled for routine phacoemulsification were enrolled in the study. Patients were randomly assigned to have implantation of the AcrySof® toric IOL or paired 2.75 or 3.20 mm opposite clear corneal incisions (OCCI) in the steep corneal axis, with implantation of spherical intraocular lens. Pre and postoperative comparison of uncorrected and best corrected visual acuity, refractive error, and corneal astigmatism were made between the 2 groups.

**Results:** A significantly greater degree of corneal astigmatism was corrected by the toric IOL than by the OCCI. Mean reduction in corneal astigmatism was 1.1 diopters in the toric IOL group in comparison to 0.6 diopters in the OCCI group. In addition, 95% of eyes achieved 20/40 or better uncorrected visual acuity following toric IOL and 70% achieved uncorrected visual acuity of 20/25 are better in that group. In contrast, 80% of eyes in the OCCI group achieved uncorrected visual acuity of 20/40 or better and 50% achieved acuity of 20/25 or better. No differences with regard to best corrected visual acuity or contrast sensitivity were seen between the 2 groups. **Conclusion:** A better clinical outcome with regard to correction of preoperative corneal astigmatism was seen in patients who underwent implantation of toric IOL in comparison to those who underwent phacoemulsification with OCCI.

**Reviewer's Comments:** In patients who have smaller degrees of corneal astigmatism and who are not inclined to undergo the expense of toric IOL implantation, opposite clear corneal incisions offer another option for correcting lower degrees of corneal astigmatism. However, it is clear that the toric IOL offers a greater ability to correct larger magnitudes of corneal astigmatism up to 2.5 diopters, which cannot be accomplished with typical clear corneal incisions even when 2 are placed in the steep corneal meridian. An awareness of both options for management of corneal astigmatism is important for cataract surgeons, given the increase in patient expectations with regard to spectacle independence following surgery that has accompanied the development of modern cataract surgery. (Reviewer-Scott D. Smith, MD).

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Keywords: Astigmatism

Print Tag: Refer to original journal article
In patients, 4-year follow-up demonstrates similar visual outcome with either photorefractive keratectomy or laser in situ keratomileusis.

**Purpose**: To compare long-term visual outcomes of photorefractive keratectomy (PRK) and laser in situ keratomileusis (LASIK) during 4 years of follow-up.

**Design**: Retrospective, comparative clinical case series.

**Methods**: A consecutive series of 22 eyes of 22 patients that underwent PRK and 18 eyes of 18 patients that underwent LASIK who had 4 years of follow-up data available were included in this study. Patients underwent refractive surgery by a single experienced refractive surgeon using standardized techniques. LASIK patients had surgery with a Nidek microkeratome with a 160μm flap thickness. Pre and postoperative evaluations were performed in all patients to assess uncorrected and best-corrected visual acuity, as well as occurrence of complications following surgery.

**Results**: Uncorrected visual acuity was statistically significantly better in LASIK patients at the 6-month and 1-year follow-up time points (20/20 versus 20/25, \( P < 0.05 \)). From 2 to 4 years follow-up, there was no significant difference in uncorrected visual acuity between groups. Best-corrected visual acuity was significantly better in LASIK patients through 2 years of follow-up, but did not differ significantly at the 3- or 4-year follow-up time points. A similar proportion of patients in each group had a refractive outcome within 0.5 diopters of the target refraction in each group at all postoperative time points through 4 years. **Conclusion**: Short-term visual outcomes are slightly better with LASIK than with PRK, but beyond the 2-year time point, visual outcome is similar with either of the 2 procedures.

**Reviewer's Comments**: This study demonstrates that differences between PRK and LASIK are most likely to disappear during long-term follow-up. More rapid recovery of visual acuity and greater patient comfort in the early postoperative period are obvious advantages of LASIK. However, flap creation has potential complications and patients who are at risk for ocular trauma or who would have an inadequate residual stromal thickness due to degree of refractive error and baseline corneal thickness may be good candidates for PRK, with similar long-term visual outcome to the more commonly performed LASIK. (Reviewer-Scott D. Smith, MD).

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**Keywords**: Laser In Situ Keratomileusis

**Print Tag**: Refer to original journal article
Participation in regular vigorous physical activity significantly reduces risk of developing macular degeneration.

**Purpose:** To evaluate association between age-related macular degeneration and participation in vigorous physical activity.

**Design:** Prospective cohort study.

**Methods:** A cohort of individuals who subscribe to a running magazine or participate in running events was identified. Individuals were invited to participate in the study through advertisements, and those who agreed completed a 2-page baseline questionnaire evaluating demographics, smoking habits, dietary habits, weight, and medical history. After a 7-year time interval, a follow-up questionnaire was completed to identify individuals who had been diagnosed with macular degeneration by an ophthalmologist during the study period. Statistical analysis was performed to identify independent risk of developing macular degeneration associated with the self-reported degree of participation in running during the 7 years of follow-up.

**Results:** Of 29,532 men who enrolled in the study, 110 developed macular degeneration. Of 12,176 women who enrolled, 42 reported developing macular degeneration. Affected individuals were older than those who were unaffected, and smoking was also reported to be more common in those who developed macular degeneration. After adjusting for these and other potentially confounding risk factors, physical activity was found to significantly protect against the development of macular degeneration. For each 1 km increment in daily running activity, a 10% reduction in macular degeneration risk was observed. In comparison to those who reported running <2 km per day, those who ran 2 to 4 km per day had a 19% lower adjusted risk, and those who ran >4 km per day had a 54% lower adjusted risk of developing macular degeneration.

**Conclusions:** Greater participation in vigorous exercise reduces risk of macular degeneration.

**Reviewer's Comments:** These results highlight the importance of addressing various risk factors associated with cardiovascular disease, which have also been shown to increase the risk of macular degeneration. These include maintaining a healthy body weight, keeping cholesterol levels under control, and participation in a daily exercise routine. Patients should not be allowed to believe that the proper method of controlling risk for macular degeneration simply comes in a vitamin pill. (Reviewer-Scott D. Smith, MD).

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Keywords: Risk Factors

Print Tag: Refer to original journal article
Approximately 10% of patients undergoing implantation of a Baerveldt glaucoma implant experience postoperative motility disturbance and/or diplopia.

**Purpose:** To investigate development of postoperative motility disturbances following glaucoma surgery with trabeculectomy or with the Baerveldt glaucoma implant. **Design:** Multicenter, randomized controlled clinical trial.

**Methods:** 200 patients were enrolled at 17 clinical centers in the Tube Versus Trabeculectomy Study. Patients underwent preoperative evaluation, which included motility examination, and were randomly assigned to undergo implantation with either 350mm2 Baerveldt glaucoma implant or performance of trabeculectomy with mitomycin C. All patients had undergone a previously failed trabeculectomy or other anterior segment surgery prior to enrollment. Postoperative examinations included repetition of motility examination and a comparison to preoperative findings.

**Results:** New onset diplopia lasting >3 months occurred in 5% of patients in the tube group and in no patients in the trabeculectomy group ($P=0.06$). A new postoperative ocular motility disturbance developed in 9.9% of patients in the tube group and in no patients in the trabeculectomy group during the first year of follow-up ($P=0.005$). Increasing patient age was a significant risk factor for development of a postoperative ocular motility disturbance. **Conclusion:** Postoperative motility disturbances are not rare following implantation of the Baerveldt glaucoma implant, occurring in up to 10% of patients.

**Reviewer’s Comments:** This study is significant in that it should remind glaucoma surgeons of the importance of discussing potential for postoperative motility disturbance with patients prior to performing glaucoma implant surgery. This can be quite troublesome to patients when it happens, as diplopia may cause a dramatic effect on quality of life. Although studies comparing the larger Baerveldt implant with the smaller Ahmed glaucoma valve are not numerous, it is generally accepted that the larger size Baerveldt implant induces more motility problems due to the presence of bulky hardware in the orbit with consequent restrictive strabismus than the smaller implant. However, this complication can occur with any glaucoma implant, and patients must be informed as part of the surgical consent process. (Reviewer-Scott D. Smith, MD).

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Keywords: Glaucoma Surgery

Print Tag: Refer to original journal article
Interobserver reliability in esotropia may vary by as much as 12 prism diopters (PD) for moderate to large (>20 PD) deviations and 6 PD for mild (10 to 20 PD) deviation.

**Background:** Error exists in measuring just about anything. Prisms are typically used to measure misalignment in childhood esotropia. However, the degree of error and reliability in this dynamic measurement is not well described.

**Objective:** To measure the 95% limits of agreement for prism and alternate cover test (PACT) at distance and near in children with esotropia.

**Design:** Prospective, multi-centered, single masked observational study.

**Participants:** 143 children with esotropia at 23 centers in the United States.

**Methods:** As part of another study investigating esotropia among children <60 months, subjects were evaluated by 2 certified examiners masked to any other measurements. Refractive correction was used if required. Children were excluded for neurologic disease or paralytic strabismus. Patients with variable or intermittent deviations were excluded. Measurements took place between 15 to 60 minutes of each other. Prisms were in increments of 1 prism diopters (PD) from 1 to 10 PD, then 2 PD increments from 10 to 20 PD, then 2.5 PD increments from 20 to 50 PD.

**Results:** 143 patients had a mean age of 22 months; 46% were female, 85% were white, 59% wore glasses, and 40% had amblyopia. Mean deviations were 32 and 37 PD for distance and near respectively ranging from 10 to 85 PD. Of deviations, <one-fourth were between 10 and 20 PD. For this group, the 95% limits of agreement for the PACT difference between measurements were 6 PD in the distance and 5 PD at near. Among patients with a deviation >20 PD, the 95% limits of agreement for the PACT difference between measurements were 10 PD in the distance and 12 PD at near. Age and amblyopia did not affect reliability.

**Conclusions:** Among children with esotropia, 12 PD and 6 PD may be a threshold for true change in moderate to large deviations (>20 PD) and mild (10 to 20 PD) deviations respectively.

**Reviewer's Comments:** This study gives a practical number to determine if you are seeing true change in a patient's esotropia on a follow-up visit. It should be noted that this doesn't necessarily apply to exotropia, patients aged >5 years, or paralytic/restrictive strabismus. (Reviewer-Michael S. Lee, MD).

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Keywords: Prism

Print Tag: Refer to original journal article
Transient Accommodation Loss in Young Patients

A Benign Syndrome of Transient Loss of Accommodation in Young Patients.

Almog Y:

Arch Ophthalmol 2008; 126 (December): 1643-1646

Transient accommodation loss may occur in younger patients lasting several months.

**Background:** Presbyopia results from slowly progressive loss of the ability to accommodate with normal aging. Acute loss of accommodation may occur from a variety of causes including trauma, pharmacologic, supranuclear or infranuclear disorders.

**Objective:** To describe a group of young patients with a benign, idiopathic transient loss of accommodation.

**Design:** Retrospective, observational case series.

**Participants:** 5 patients from a single center in Israel examined from 1997 to 2006 and identified with rapid loss of accommodation.

**Methods:** Each patient underwent a comprehensive neuro-ophthalmologic history and examination. History explored any antecedent febrile illness, toxic exposure, or trauma. Examination included a manifest and cycloplegic refraction, near point of convergence, accommodative amplitude, convergence amplitudes, cover testing, slit lamp evaluation, pupillary examination, and a dilute pilocarpine 0.125% test. Of patients, 4 underwent a brain MRI.

**Results:** Patients ranged in age from 8 to 21 years with follow-up from 4 to 15 months. Each had an acute onset of symptoms over days. All were emmetropic or hyperopic by cycloplegic refraction and correctable to 20/20 acuity. Of patients, 1 wore spectacles for accommodative esotropia. All had normal convergence amplitudes, near point of convergence, normal pupils to light and near stimulus, and a normal dilute pilocarpine test. Brain MRI was normal in 4 patients. Each patient recovered completely between 3 and 14 months.

**Conclusions:** An isolated, idiopathic, transient loss of accommodation may occur in children and young adults.

**Reviewer's Comments:** Reviewer's Comments: In the absence of pupillary findings, it is hard to determine the cause of this phenomenon. It is certainly possible that this is a nonphysiologic problem and these patients simply get better with reassurance. However, the author reasonably argues that these patients would most likely have other subjective findings like poor convergence amplitudes or near point of convergence. They most likely would not have improved with a near add. In either case, this is reassuring if a patient presents with these findings. (Reviewer-Michael S. Lee, MD).

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Keywords: Presbyopia

Print Tag: Refer to original journal article
Injections of brimonidine into the rat peritoneum appear to improve retinal ganglion cell survival from optic nerve crush.

**Background:** When the optic nerve is damaged with loss of ganglion cell axons, there is generally permanent visual loss. If a patient were on a neuroprotective agent prior to the optic nerve injury this may mitigate the outcome.

**Objective:** To study retinal ganglion cell (RGC) survival in the rat after optic nerve crush with and without the use of brimonidine.

**Design:** Randomized, placebo controlled experimental animal study.

**Participants:** 20 Sprague-Dawley rats.

**Methods:** Rats were randomized to receive intraperitoneal injections of either 1 mg/kg of brimonidine (n=8) or saline (n=12) 1 hour before the right optic nerve was crushed. Weekly injections were performed after the crush for 4 weeks. To crush the nerve, a lateral canthotomy was performed to allow exposure of the optic nerve. A clamp with 40 grams of power was used to crush the nerve just behind the globe for 60 seconds. At 23 days after the crush, fluorogold was injected into both superior colliculi through a craniotomy. Animals were sacrificed 5 days later. Photographs of retinas were taken with a fluorescent microscope and the number of RGC was counted in an automated fashion. Survival percentage was calculated as density of RGC in the right eye divided by the density of RGC in the left eye.

**Results:** Mean density of RGC for the unaffected left eyes was approximately 2000 cells/mm² and this did not differ between groups. Brimonidine treated animals showed a mean density of approximately 1300 cells/mm² or 61% survival rate. Saline treated animals demonstrated a mean density of approximately 1100 cells/mm² or 53% survival rate. There was a significant difference in mean density of RGC and survival rates between the 2 groups.

**Conclusions:** More RGC's survive optic nerve crush in rats if they are treated before and after injury with intraperitoneal injections of brimonidine.

**Reviewer's Comments:** This study contributes to the growing literature that brimonidine may be a candidate as a neuroprotective agent. Unfortunately, a neuroprotective effect for brimonidine has never been shown in humans. (Reviewer-Michael S. Lee, MD).

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Keywords: Brimonidine

Print Tag: Refer to original journal article
Idiopathic chiasmal neuritis is similar to unilateral optic neuritis in demographics, clinical features, and development of multiple sclerosis.

Background: Chiasmal neuritis may result from systemic inflammatory disease or infectious process. Case reports and small cases series have described the clinical features of idiopathic chiasmal neuritis, but long-term follow-up and prognosis are absent.

Objective: To describe visual and neurologic outcomes of a large cohort of patients with idiopathic chiasmal neuritis.

Design: Retrospective, consecutive, observational case series.

Participants: 20 patients with chiasmal neuritis from Indiana.

Methods: For inclusion in this study, patients had to have acute vision loss with a bitemporal or junctional visual field defect. Patients with any systemic disease known to affect the chiasm or imaging showing hemorrhage/compression of the chiasm were excluded. Patients with intraorbital optic nerve enhancement or disc edema were also excluded.

Results: There were 6 men and 14 women with a mean age of 37 years. Also, 18 patients were white and 2 were black. Of patients, >40% experienced monocular visual loss and the rest had bilateral simultaneous or rapidly sequential visual loss. At the initial visit, acuity ranged from 20/15 to light perception, with almost 30% of eyes seeing 20/200 or worse. Eye pain occurred in 20%. Laboratory testing revealed 1 patient with an elevated antineutrophil antibody titer but no other evidence of systemic vasculitis. Of 15 patients who had an MRI, 12 showed enlargement and enhancement of the chiasm and 3 had normal appearing chiasms. White matter lesions were observed in 6 of 15 scans. Of 6 patients undergoing lumbar puncture, 2 showed evidence of demyelination. Of patients, 9 received oral corticosteroids and 8 received intravenous corticosteroids. Mean followup was 5.7 years. Of 15 patients completing at least 1 year of follow-up, 6 developed clinically definite multiple sclerosis (MS). Final median acuity was 20/20 with 97% of eyes achieving 20/40 or better.

Conclusions: With the exception of eye pain, idiopathic chiasmal neuritis is similar to unilateral optic neuritis in demographics, clinical features, and development of MS.

Reviewers Comments: It is no surprise that fewer patients describe eye pain. Eye pain in optic neuritis results from inflammation of the annulus of Zinn, which is a couple of centimeters anterior to the chiasm. In patients with chiasmal neuritis we should be just as concerned about MS. (Reviewer-Michael S. Lee, MD).

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Keywords: Chiasmal Neuritis

Print Tag: Refer to original journal article
Older patients who develop idiopathic intracranial hypertension are less likely to be obese or have headache.

**Background:** The typical demographic for idiopathic intracranial hypertension (IIH) is an obese woman aged 20 to 40 years.

**Objective:** To describe clinical characteristics of a cohort of patients with IIH aged ≥40 years.

**Design:** Retrospective, observational chart review.

**Participants:** 23 patients with IIH from a single institution in Israel who fulfilled the modified Dandy diagnostic criteria for IIH between 1998 and 2007.

**Methods:** Data were collected on symptomatology, neuroimaging, body mass index (BMI), and other risk factors. Patients aged <40 were excluded.

**Results:** 27 patients fulfilled the criteria but only 23 had complete follow-up data. Mean age of cohort was 51 years with a range of 41 to 79 years. All but 1 of the patients were women. Of patients, 60% had a BMI >30. Hypertension was present in 13 (56%), diabetes in 3 (13%), and thyroid disease in 3 (13%). Of patients, 17 had symptoms of increased intracranial pressure, 11 had headache, and 15 had visual symptoms. Of patients, 6 were asymptomatic and were worked up because of papilledema discovered on routine examination. Acuities ranged from 20/100 to 20/20 and almost 50% had a visual field defect. All patients received oral treatment and none underwent surgical intervention. Final acuities ranged from 20/25 to 20/20; 17 had normal visual fields and 6 had persistent defects.

**Conclusions:** IIH among patients aged ≥40 years are more likely to present with systemic hypertension, less headache, and less obesity than a younger cohort. The majority of these patients are women. Overall visual prognosis is very good.

**Reviewer's Comments:** Older patients with IIH are less likely to be obese and less likely to complain of headache. Like younger patients, the overwhelming majority are female. Systemic hypertension was more common than younger patients and the general population. While it is conceivably a risk factor, it is such a common disorder that it seems unlikely. (Reviewer-Michael S. Lee, MD).

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Keywords: Pseudotumor Cerebri,

Print Tag: Refer to original journal article
The multifocal electroretinogram in infants demonstrates smaller amplitudes and longer implicit times compared to adults and the amplitudes do not vary with eccentricity.

**Background:** The multifocal electroretinogram (mFERG) is a powerful tool that assesses the cone system in discreet areas in the central 50° of the macula. Cones in the infant are evenly distributed whereas in the adult, cones are predominantly within the central 5° of the macula.

**Objective:** To assess mFERG responses in infants aged 10 weeks and compared them to adults.

**Design:** Prospective comparative study.

**Participants:** 23 healthy infant and 10 adult volunteers in Boston, Massachusetts.

**Methods:** Infants did not wear correction and adults wore their spectacles. After dilating the left pupil, a Burian-Allen electrode was placed on the cornea. For stimulation, a 61-hexagon array on a computer screen was displayed to each subject. Stimulus sequence was divided 8 segments of 27 seconds. Infants were held on an investigator's lap with support for the chin. An observer monitored fixation and discarded the segment if the child looked away. Amplitudes and implicit times of the 2 negative and 1 positive peak of the first order kernel were calculated for the entire 61 hexagons and concentric rings separately.

**Results:** Infants' age ranged from 61 to 77 days and adults' age ranged from 22 to 51 years. Infants' responses were significantly smaller in amplitude and longer in implicit time for the first order kernel. Ring analysis showed that infant amplitudes did not vary significantly with eccentricity but adults showed significant declines in amplitude with increasing eccentricity. Implicit time did not vary among the rings for both infants and adults.

**Conclusions:** Infant mFERG amplitudes are smaller and implicit times are longer than adults. Unlike adults, the mFERG amplitudes in infants do not vary with eccentricity.

**Reviewer's Comments:** This is good to keep in mind if an mFERG is performed on an infant to determine why they do not exhibit good visual behavior. Without this information, one could easily say that amplitudes are reduced, implicit times are prolonged, and the central fovea is much reduced compared to what we are normally used to seeing. An infant could mistakenly been told they had a cone disorder. (Reviewer-Michael S. Lee, MD).

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Keywords: Multifocal Electroretinogram

Print Tag: Refer to original journal article
Explorative saccade training improves visual behavior in patients with hemianopia without changing the visual field defect.

**Background:** Homonymous hemianopia can drastically affect quality of life from its effect on driving, spatial orientation, and reading speed. Various therapies have been targeted at restoring visual field by stimulating the blind border of the hemifield defect and saccadic exploration.

**Objective:** To compare explorative saccade training (EST) and flicker stimulation training (FT) among a group of patients with hemianopia.

**Design:** Prospective, randomized clinical trial.

**Participants:** 30 patients with hemianopia from a single center in Germany.

**Methods:** Patients with an isolated hemianopia for >6 months were randomized to receive either EST or FT. Inclusion criteria were visual acuity ≥20/30 and defects that occurred within 5° of the vertical midline. Patients with any other neurologic or ophthalmologic diseases, anything that would impair use of a computer, and hemi-neglect were excluded. In EST, a customized program randomly generated digits from 0 to 9 equally in both hemifields. The patient was asked to search out specific numbers and click on them with the mouse. In FT, the patient stared at 4 letters in the middle of the screen. To either side a suprathreshold letter would flash at 20° eccentricity. The patient would then choose which of the 4 letters they thought flashed. Patients trained at home for 30 minutes twice daily, 5 days a week for 6 weeks. Patients were then tested on their ability to find objects on a table (table test), digits on a screen (digit search task), fixation stability while viewing a scene, formal perimetry, reading speed, and a quality of life questionnaire. These were tested at 3 time points: before training, immediately after training, and 6 months after training was complete.

**Results:** 2 patients dropped out from the FT group leaving 15 in the EST and 13 in the FT. Groups were similar in age, diagnosis, and duration of disease. The EST group performed substantially better compared to baseline and also the FT group for the digit search task and the table test. The EST group demonstrated significant increases in fixations to the blind hemifield compared to baseline and the FT group. Perimetry and reading speed did not change in either group. The EST group reported greater improvement in quality of life than the FT group.

**Conclusions:** EST improves scene exploration, search strategies, and reported quality of life compared to flicker stimulation training. Neither training strategy improves reading speed or visual field.

**Reviewer's Comments:** This method appears to encourage patients to constantly shift their eyes around to improve their ability to see an entire scene and to search for objects within that scene. (Reviewer-Michael S. Lee, MD).

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Keywords: Hemianopia

Print Tag: Refer to original journal article
Public awareness about glaucoma improved after a media campaign providing educational messages about the disease was aimed at a target population.

**Objective:** To determine whether a public education campaign is effective in increasing awareness and understanding of glaucoma.

**Design:** Prospective, interventional study.

**Participants/Methods:** Individuals of Indian descent in the United Kingdom were identified as the target population for this study. A sample of 300 individuals was used to assess baseline awareness of glaucoma. This was accomplished through a standardized questionnaire that was administered in a face-to-face interview in the individual’s native language (Hindi). A health education campaign was then launched within the target population which consisted of 3 television advertisements presented daily on 5 Hindi language television stations, English and Hindi advertisements in the local newspaper, daily radio advertisements on Hindi language radio stations, 2 interviews during the 6-month period with a glaucoma specialist broadcast on these radio stations, and posters placed at places of worship frequented by the Hindi language population in the area. After the media campaign, another series of interviews was conducted in 307 individuals in the target population, and the level of awareness of glaucoma was compared before and after the media campaign.

**Results:** The proportion of individuals who had heard of glaucoma and were aware of the condition increased from 23% to 56% following the media campaign. Prior to intervention, the majority of individuals reported hearing about glaucoma either from their general practitioner or from a family member or friend. In contrast, following the media campaign, 69% of participants reported having first heard about glaucoma from the television or radio.

**Conclusions:** A public education campaign through media and television can effectively increase public awareness of glaucoma.

**Reviewer’s Comments:** Additional work is required to further understand how the increased awareness that can be achieved through a public health campaign to education the population about glaucoma will influence their health-seeking behavior. (Reviewer-Scott D. Smith, MD).

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Keywords: Glaucoma

Print Tag: Refer to original journal article
ABO blood type match between the donor and recipient of a corneal transplant has no impact on the risk of graft rejection following surgery in low-risk recipients.

**Objective:** To investigate whether ABO blood type matching between donor and recipient influences the risk of graft rejection following penetrating keratoplasty (PK) in patients at low risk for rejection.

**Design:** Multi-center, prospective, double-masked clinical trial.

**Methods:** Patients undergoing PK who had Fuchs corneal endothelial dystrophy or pseudophakic bullous keratopathy who were schedule for corneal transplantation were enrolled in this study. These conditions were considered to put them at moderate risk of graft failure, but low risk of graft rejection. All patients underwent ABO blood typing, and ABO blood type information was available for all corneal donors. During 5-year follow-up, episodes of graft rejection were documented and all graft failures were classified on the basis of occurring due to non-immunologic failure of the corneal endothelium or immunologic rejection of the graft. In addition, standardized measurement of corneal endothelial cell density was performed and graded at a masked reading center.

**Results:** There were no significant differences in the rate of either immunologic graft failure or the occurrence of an episode of graft rejection based on ABO compatibility. The 5-year cumulative rate of graft failure due to immunologic rejection was 6% in those patients who shared the ABO blood type of their donor and 4% in those who were ABO mismatched. In both groups, 5-year risk of having a rejection episode was 12%.

**Conclusions:** In patients who are at low risk of developing graft rejection following PK, ABO matching does not influence the risk of developing graft rejection.

**Reviewer's Comments:** Although there has been inconsistency in the results of previous studies investigating this issue, some have suggested that ABO typing is important in minimizing the risk of postkeratoplasty graft rejection. This study suggests that only those patients who are at higher risk for graft rejection, such as those with inflammatory conditions or corneal neovascularization may need a donor that is ABO matched. Further studies in high-risk patients are needed to further delineate the role that ABO typing should play in this process, but it seems clear that in low-risk patients the surgeon need not be concerned about the patient's and donor's blood type. (Reviewer-Scott D. Smith, MD).

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**Keywords:** Blood Incompatibility

**Print Tag:** Refer to original journal article
In comparison to other treatments, topical cyclosporine offers reasonable improvement in quality of life for patients with refractory moderate to severe dry eye symptoms to be considered a cost-effective therapy.

**Objective:** To evaluate relative cost-effectiveness of topical cyclosporine 0.05% (Restasis®) in the treatment of moderate to severe dry eye syndrome.

**Methods:** Data from 2 multicenter, randomized clinical trials of the efficacy of topical cyclosporine were analyzed. All patients in these trials had chronic symptoms that persisted in spite of therapy with topical lubricants. In addition, all patients had objective findings of chronic dry eye including Schirmer test results <5mm in 5 minutes, corneal and/or conjunctival fluorescein staining, and an elevated Ocular Surface Disease Index score. Standardized methods were used to quantify the "utility" or benefit of therapy over time, which was reported as quality-adjusted life-years (QALY). Cost associated with a one unit increase in QALY for patients was then calculated.

**Results:** The value gain associated with therapy with cyclosporine was 0.0319 QALY per year greater than topical lubrication therapy. This represented a 4.3% increase in quality of life for the average patient with moderate to severe dry eyes that was not responsive to lubrication therapy. Cost per incremental QALY was $34,953 which is lower than costs per QALY for other widely used treatments in ophthalmology.

**Conclusions:** Topical therapy with cyclosporine 0.05% is a cost-effective therapy for the treatment of moderate to severe dry eye syndrome in patients with symptoms that persist in spite of topical lubrication.

**Reviewer's Comments:** This study used standard methods for assessing cost-effectiveness of therapy and found cyclosporine to be of sufficient value to be considered cost-effective in comparison to other medications that are widely used, including intravitreal ranibizumab injection for treatment of exudative macular degeneration ($50,691 per QALY). It must be emphasized that for cost-effectiveness, it should be used only in patients with at least moderate symptoms and only in those who are not adequately managed with less expensive topical lubrication. However, in those patients who suffer from chronic dry eye that does not respond to conservative therapy, topical cyclosporine (Restasis®) should be considered. (Reviewer-Scott D. Smith, MD).

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Keywords: Dry Eye

Print Tag: Refer to original journal article
There is a decrease in corneal endothelial cell count associated with the use of mitomycin-C during pterygium excision.

**Objective:** To evaluate effect of intraoperative application of mitomycin-C (MMC) during pterygium excision on the corneal endothelium through 3 months of follow-up.

**Design:** Prospective, comparative, non-randomized clinical study.

**Participants:** A consecutive series of patients who underwent pterygium excision at a single institution.

**Methods:** Some patients underwent primary excision of a pterygium without conjunctival autografting or application of intraoperative mitomycin-C for primary pterygium, while others underwent removal of a recurrent pterygium with conjunctival autografting and intraoperative MMC application (0.02% for 2 minutes). Pre and postoperative endothelial cell counts were compared between the 2 groups through 3 months of follow-up.

**Results:** Mean preoperative endothelial cell count did not differ between the 2 groups. At 1-month following surgery, a statistically significant decrease in endothelial cell count of 6% was seen in the group treated with MMC ($P=0.03$), while no significant decrease in endothelial cell count was seen in the control group. At 3-months follow-up, endothelial cell counts remained below baseline levels in MMC treated patients, but remained stable in control patients. **Conclusion:** Use of intraoperative MMC during pterygium excision appears to result in corneal endothelial cell loss.

**Reviewer's Comments:** The difference in early postoperative endothelial cell counts between MMC and control groups should remind us that this is a potent drug with potential adverse effects. It should be used judiciously, with awareness of its potential adverse effects. Short-term follow-up in this study does not provide insight into whether there are clinically significant effects on the cornea and on visual outcome. In addition, the non-randomized nature of this study and the fact that those who had MMC had undergone previous pterygium excision and also had a more extensive surgery with conjunctival autograft means that the results of this study cannot be considered to be definitive. Future studies are needed to further elucidate the role that MMC should play in pterygium excision surgery. (Reviewer-Scott D. Smith, MD).

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Keywords: Pterygium Excision

Print Tag: Refer to original journal article
Objective: To investigate efficacy of liquid nitrogen cryotherapy for treatment of superior limbic keratoconjunctivitis (SLK).

Design: Interventional, non-comparative clinical case series.

Methods: 7 eyes of 4 female patients with SLK who underwent treatment with liquid nitrogen cryotherapy were included in this case series. Each eye was treated with a double freeze-thaw technique with application of the liquid nitrogen to the affected superior limbic conjunctiva using a spray tip. Aperture size for the spray tip ranged between 0.013 and 0.040 inches. Clinical diagnosis of SLK was based upon the presence of typical findings including superior conjunctival injection and thickening, with associated symptoms of ocular pain and irritation, burning, foreign body sensation, epiphora, and blepharospasm. All patients failed to respond to typical conservative measures such as artificial tears prior to being treated with liquid nitrogen cryotherapy. The procedure was done in the physician's office using topical anesthesia. After 1-2 seconds of freezing, a chalk white appearance of the conjunctiva was seen and was the clinical endpoint used to terminate freezing treatment. After a complete thaw, the procedure was repeated once. Patients were monitored postoperatively for improvement of their signs and symptoms, and for recurrence of the condition.

Results: Resolution of signs and symptoms of SLK was observed in all eyes within 2 weeks after treatment. Recurrence of symptoms occurred within 3 months in 3 eyes, prompting retreatment with the same technique of liquid nitrogen cryotherapy. With a second session of cryotherapy when necessary, all patients were found to have resolution of disease without further recurrences in the period of observation, which ranged from 7 to 21 months.

Conclusions: Liquid nitrogen cryotherapy is an effective treatment for SLK. Although some patients develop recurrence of disease after a single session, repeat treatment is effective in eliminating signs and symptoms of the condition.

Reviewer’s Comments: Surgeon experience with this technique is important in order to minimize unnecessary freezing of adjacent ocular tissues. With that caveat, this appears to be an effective alternative to other treatments which have been previously employed, including chemical cautery and superior conjunctival resection. (Reviewer-Scott D. Smith, MD).

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Keywords: Superior Limbic Keratoconjunctivitis

Print Tag: Refer to original journal article
Adjustable IOL Effective in Minimizing Postoperative Refractive Error

Correction of Residual Hyperopia After Cataract Surgery Using the Light Adjustable Intraocular Lens Technology.

Chayet A, Sandstedt CA, et al:

Am J Ophthalmol 2009; 147 (March): 392-397

Postoperative adjustment of the refractive power of a light-adjustable intraocular lens can minimize postoperative refractive error.

**Objective:** To evaluate efficacy of a light-adjustable posterior chamber intraocular lens (IOL) used to minimize postoperative residual hyperopia in patients undergoing cataract surgery.

**Design:** Prospective, non-randomized clinical trial.

**Participants:** Consecutive series of 14 eyes of 14 patients who underwent cataract surgery with implantation of a light-adjustable IOP and who had residual hyperopia in the range of +0.25 to +2.00 diopters. The IOL is 3-piece silicone and constructed of a photoreactive polymer that exhibits a controllable change in contour and refractive power in response to exposure to a specific wavelength of ultraviolet (UV) light. Patients were instructed to wear specific UV-blocking protective sunglasses until the final lock-in procedure for the IOL was performed. At 1- to 2-weeks following surgery, best-corrected visual acuity was measured after measurement of the manifest refractive error. Results of this refraction were used to perform adjustment of the IOL power with controlled UV light exposure. Final lock-in procedure was performed 1 day later. Final refractive error was measured 6 to 12 months later.

**Results:** Of the 14 eyes included in this study, 93% had a final refractive error within 0.25 diopters of emmetropia at 12 months following surgery. Of eyes, 100% had refractive error within 0.5 diopters of emmetropia. Sequential measures of refractive error during the first year after surgery demonstrated a mean change in refractive error of 0.006 diopters per month, which is considerable more stable than corneal refractive procedures.

**Conclusions:** The use of a light-adjustable IOL allows effective treatment of residual hyperopia following cataract surgery with stable results during at least one year following surgery. **Reviewers Comments:** Residual hyperopia can lead to significant patient dissatisfaction following cataract surgery due to decreased visual acuity at distance and even worse visual acuity at near. The technology described in this article allows postoperative empirical adjustment of the IOL power by selective exposure to UV light and thus adjust the patient's refractive error before "locking in" the IOL power with additional UV light exposure. Such a system has the potential to reduce our dependence upon IOL power calculations, which have some degree of inherent lack of predictability. (Reviewer-Scott D. Smith, MD).

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Keywords: Residual Hyperopia

Print Tag: Refer to original journal article
Objective: To investigate effect of compensatory head posture in nystagmus patients on the range of neck movement and associated quality of life.

Design: Prospective, comparative clinical study.

Participants: Cohort of 20 patients with nystagmus who participate in a nystagmus support group.

Methods: All patients eligible for participation were aged ≥17 years and had a compensatory head posture which was chronically adopted to minimize the amplitude of nystagmus to improve stability of vision. Patients with a known history of neck problems, or who had vertebrobasilar insufficiency were excluded from participation. A control group of 26 healthy individuals was also recruited for comparison to cases. All study subjects underwent evaluation including ophthalmic examination, visual acuity, and range of neck movement using an inclinometer. In addition, all subjects underwent a quality of life assessment administered by a standardized questionnaire.

Results: Range of neck movement was significantly reduced in patients with nystagmus and a compensatory head position in comparison to control subjects. The greatest reduction in range of motion was seen with lateral flexion ($P=0.001$). In spite of the reduced range of neck movement seen on physical examination, there were no differences in reported quality of life based upon the results of the questionnaire.

Conclusions: Although significant reduction in range of neck movement is associated with a compensatory head posture in patients with nystagmus, there appears to be little effect on the quality of life in most affected individuals.

Reviewer's Comments: The study also included a questionnaire mailed to ophthalmologists in the United Kingdom. Most reported being influenced by a compensatory head posture to recommend surgical intervention. This study suggests that most patients with a compensatory head position will not develop any quality of life issues related to this condition and that surgical intervention to eliminate a compensatory head position may not always be necessary. (Reviewer-Scott D. Smith, MD).

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Keywords: Nystagmus

Print Tag: Refer to original journal article
Although the proportional decrease in intraocular pressure is smaller, prostaglandins are effective in lowering intraocular pressure even in patients with normal-tension glaucoma.

**Objective:** To investigate efficacy of prostaglandin analog travoprost in reducing intraocular pressure (IOP) in patients with normal tension glaucoma (NTG).

**Design:** Prospective, non-randomized clinical trial.

**Participants:** 45 patients with NTG, diagnosed on the basis of presence of characteristic glaucomatous optic nerve damage and visual field loss in the absence of a history of IOP elevation >21 mmHg without medical treatment.

**Methods:** IOP assessment prior to enrollment included performance of a diurnal IOP curve to ensure that fluctuation in the IOP did not exceed 21 mmHg. Patients were instructed to use travoprost 0.004% (Travatan®) once daily in the evening in 1 eye, selected at random. Periodic measurement of IOP was performed during 12 months of follow-up. Comparison of IOP at each follow-up was made to the baseline level of IOP.

**Results:** Mean IOP at baseline was 14.8±2.5 mmHg. A significant reduction in mean IOP was noted following initiation of therapy with travoprost at all follow-up time points from 2 weeks after initiation of treatment through the full 12 month follow-up period. At 2 weeks, mean IOP decreased to 11.3±2.0 mmHg, representing a reduction of 23.6%. There was no significant difference in mean IOP between any follow-up study visits, indicating that IOP remained consistent throughout the 12 months of follow-up.

**Conclusions:** Travoprost is effective in lowering IOP in patients with NTG.

**Reviewer's Comments:** The only proven intervention shown to reduce the risk of progression of glaucoma, whether it is typical high-pressure glaucoma or normal-tension glaucoma, is reduction of IOP. This study confirms that sustained IOP reduction can be achieved with travoprost even in patients with no known history of IOP elevation. Although the proportional decrease in IOP is only about 20%, in contrast to the typical mean IOP reduction of about 30% in patients with elevated IOP, travoprost did provide long-term, stable IOP reduction over a full year of therapy. (Reviewer-Scott D. Smith, MD).

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Keywords: Glaucoma

Print Tag: Refer to original journal article
Intraoperative 5-FU, MMC Equally Effective in Improving IOP After Trabeculectomy

Long-term Outcomes of Intraoperative 5-Fluorouracil versus Intraoperative Mitomycin C in Primary Trabeculectomy Surgery.

Palanca-Capistrano AM, Hall J, et al:

Ophthalmology 2009; 116 (February): 185-190

Efficacy and adverse effects of intraoperative 5-fluorouracil and mitomycin-C are similar when used as a supplement for glaucoma filtering surgery.

Objective: To compare long-term efficacy and safety of trabeculectomy with supplemental 5-fluorouracil (5-FU) or mitomycin-C (MMC).

Design: Prospective, comparative clinical case series. Participants/Design: Prospective, randomized clinical trial of 105 patients undergoing trabeculectomy with supplemental 5-FU or MMC. Patients had medically uncontrolled glaucoma and were undergoing initial glaucoma surgery. They were randomized to have supplemental 5-FU 50 mg/ml applied topically to the sclera at the site of surgery for 5 minutes or MMC 0.2 mg/ml applied for 2 minutes. Surgeon and patients were masked as to which antimetabolite was used. Patients received a standardized regimen of postoperative antibiotics and steroids, and were monitored following surgery at periodic intervals through 5 years of follow-up. Patients in the 2 groups were compared with respect to control of intraocular pressure (IOP), occurrence of postoperative complications, and need for supplemental glaucoma medication or additional surgery to control IOP.

Results: Mean IOP was significantly decreased from baseline in both groups. There were no statistically significant differences in IOP between groups at any time point following surgery. Surgical success was defined by an IOP from 6 to 21mmHg without supplemental medications, and a decrease in IOP of ≥20% from baseline. Using this definition, the 3-year success rate of trabeculectomy with MMC was 83%, in comparison to 79% with 5-FU, a difference that was not statistically significant. There were no differences between groups in rate of development of postoperative complications, including hypotony, bleb leaks or bleb infections.

Conclusions: The clinical results of trabeculectomy with supplemental MMC or 5-FU are similar with regard to IOP control and development of postoperative complications.

Reviewer's Comments: Although MMC is more potent in its effect on impairing fibroblast proliferation and controlling the healing response after surgery, a similar effect can be achieved with a longer duration of exposure of the ocular surface to the less potent 5-FU. When an adequate response is achieved to modify the healing response with either drug, development of a thin bleb which predisposes to bleb leaks and infections also occurs with similar frequency. (Reviewer-Scott D. Smith, MD).

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Keywords: Glaucoma Filtering Surgery

Print Tag: Refer to original journal article
Inferior Placement of AGV Associated With More Postoperative Complications

Superior Versus Inferior Ahmed Glaucoma Valve Implantation.

Pakravan M, Yazdani S, et al:

Ophthalmology 2009; 116 (February): 208-213

Placement of a glaucoma implant in the superotemporal quadrant may result in fewer postoperative complications than when it is placed in an inferior quadrant.

Objective: To compare efficacy and safety of implantation of the Ahmed Glaucoma Valve (AGV) in superior versus inferior quadrants.

Design: Prospective, interventional clinical case series.

Participants: 106 eyes of 106 patients with refractory glaucoma who required implantation of an AGV for control of intraocular pressure (IOP).

Methods: Location of implantation was performed at the discretion of the operating surgeon. All patients underwent a similar surgical technique with implant plate secured to the sclera 8 to 10 mm posterior to the limbus. Postoperative evaluation included measurement of IOP and identification of surgical complications.

Statistical analysis was performed to compare clinical outcomes between those patients who had plate secured in either the superotemporal or superonasal quadrant to those who had plate secured in one of the inferior quadrants.

Results: Of 106 eyes, 58 had the AGV implanted in superior quadrants, while 48 had the implant placed in inferior quadrants. There were no significant differences between groups in baseline IOP or any other clinical characteristics. Mean follow-up period was 10.6 months. Both groups showed a statistically significant reduction in IOP from baseline with no difference in degree of IOP control between groups. There was a mean decrease in IOP of 47% from baseline in those with an implant placed in a superior quadrant and a decrease of 43% in those with the implant placed in an inferior quadrant. However, postoperative complications including implant exposure requiring removal, a cosmetically unacceptable appearance, and endophthalmitis was more common in those patients who had the implant placed in an inferior quadrant (25% vs 5%, P = 0.004).

Conclusions: Postoperative complications occur more frequently when the AGV is placed in an inferior quadrant than when it is placed in a superior quadrant.

Reviewer's Comments: Postoperative exposure of hardware, as well as avoidance of a cosmetically unacceptable appearance after glaucoma implant surgery requires that the implant be adequately covered by the eyelids. This is easier to accomplish when the implant is placed in a superior quadrant. Some glaucoma surgeons advocate routine placement of AGV in the inferotemporal quadrant, but this study indicates that if this approach is taken, extreme care must be exercised to ensure that the implant plate is placed adequately posterior and inferior to avoid potential problems after surgery. In my experience, it is technically easiest to place the AGV in the superotemporal quadrant. I place the implant in the inferotemporal quadrant only when other clinical factors preclude its placement superotemporally. (Reviewer—Scott D. Smith, MD).

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Keywords: Glaucoma Surgery

Print Tag: Refer to original journal article