Treatment for Glaucoma: Comparative Effectiveness

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Preface

The Agency for Healthcare Research and Quality (AHRQ) conducts the Effective Health Care Program as part of its mission to organize knowledge and make it available to inform decisions about health care. As part of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, Congress directed AHRQ to conduct and support research on the comparative outcomes, clinical effectiveness, and appropriateness of pharmaceuticals, devices, and health care services to meet the needs of Medicare, Medicaid, and the Children’s Health Insurance Program (CHIP).

AHRQ has an established network of Evidence-based Practice Centers (EPCs) that produce Evidence Reports/Technology Assessments to assist public- and private-sector organizations in their efforts to improve the quality of health care. The EPCs now lend their expertise to the Effective Health Care Program by conducting Comparative Effectiveness Reviews (CERs) of medications, devices, and other relevant interventions, including strategies for how these items and services can best be organized, managed, and delivered.

Systematic reviews are the building blocks underlying evidence-based practice; they focus attention on the strength and limits of evidence from research studies about the effectiveness and safety of a clinical intervention. In the context of developing recommendations for practice, systematic reviews are useful because they define the strengths and limits of the evidence, clarifying whether assertions about the value of the intervention are based on strong evidence from clinical studies. For more information about systematic reviews, see www.effectivehealthcare.ahrq.gov/reference/purpose.cfm.

AHRQ expects that CERs will be helpful to health plans, providers, purchasers, government programs, and the health care system as a whole. In addition, AHRQ is committed to presenting information in different formats so that consumers who make decisions about their own and their family’s health can benefit from the evidence.

Transparency and stakeholder input are essential to the Effective Health Care Program. Please visit the Web site (www.effectivehealthcare.ahrq.gov) to see draft research questions and reports or to join an email list to learn about new program products and opportunities for input. Comparative Effectiveness Reviews will be updated regularly.

We welcome comments on this CER. They may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by email to epc@ahrq.hhs.gov.

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Structured Abstract

Objectives. Glaucoma is a leading cause of visual impairment and blindness worldwide. Treatment focuses on the reduction of intraocular pressure (IOP), which secondarily prevents worsening of visual field loss; in this way, available treatments may prevent visual impairment and blindness. The objective of this Comparative Effectiveness Review is to summarize the evidence regarding the safety and effectiveness of medical, laser, and other surgical treatments for open-angle glaucoma in adults.

Data Sources. We searched MEDLINE®, Embase, LILACS, and CENTRAL through October 6, 2011 to identify clinical trials. We searched MEDLINE and CENTRAL (from 2009 to March 2, 2011) and screened an existing database to identify relevant systematic reviews.

Review Methods. Two reviewers independently assessed citations for eligibility. One reviewer assessed the risk of bias and extracted descriptions of the study. A second reviewer verified the data. Two reviewers also screened the results for systematic reviews. Details about the eligible systematic reviews were abstracted, including elements related to the methodological rigor.

Results. We identified 23 systematic reviews. Twelve reviews addressed medical treatments, 9 addressed surgical treatment, and 1 compared medical versus surgical treatments. One review addressed different surgical treatments as well as medical versus surgical treatments. We identified 73 RCTs and 13 observational studies addressing adverse effects. We identified no studies that evaluated treatments with regard to their impact on visual impairment. We also found insufficient evidence comparing treatment versus no treatment on patient-reported outcomes. No studies addressed the possible link between intermediate outcomes (IOP, optic nerve structure, or visual field) and visual impairment or patient-reported outcomes. There is moderate evidence that medical and surgical treatments can lower IOP and reduce the risk of progression by both visual field and optic nerve criteria. Among medical treatments, the prostaglandin agents are superior to other classes with regard to lowering IOP. While laser trabeculoplasty decreases IOP, the technology used does not make a difference in pressure lowering. With regard to incisional surgeries, trabeculectomy provides more pressure lowering than the class of nonpenetrating procedures. As expected, incisional surgeries produce more significant side effects than do medical treatments.

Conclusions. We did not find evidence addressing direct or indirect links between glaucoma treatment and visual impairment or patient-reported outcomes. This should be an area of focus in future trials of adequate size and duration to detect differences between treatment groups. However, we did find that a number of medical and surgical treatments clearly lower IOP and can prevent visual field loss and optic nerve damage. While we found direct comparisons between some treatments, there are significant gaps in our knowledge of comparative effectiveness.
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Background

Glaucoma is a leading cause of visual impairment and blindness both in the United States and worldwide. It is estimated to affect 60.5 million people worldwide. Glaucoma is defined as an acquired disease of the optic nerve (neuropathy) characterized by specific changes of the optic nerve and by visual field defects that correspond to the areas of optic nerve structural damage. Depending on whether the optic nerve damage is associated with an open or closed appearance to the drainage channels for aqueous humor in the front of the eye, the glaucoma is referred to as open-angle (the subject of this report) or closed angle.

Mild glaucoma damage to the optic nerve may be asymptomatic, but as the damage worsens, the patient begins to have difficulty with peripheral vision, contrast sensitivity, glare, and moving from light to dark and dark to light. These symptoms of visual impairment may affect activities of daily living and quality of life. In its most severe form, glaucoma results in total irreversible blindness.

Although deficient blood supply to the optic nerve, inadequate structural support for the neurons that make up the optic nerve, and insufficient supplies of neurotrophins needed to maintain the health of the optic nerve have been hypothesized as risk factors for glaucoma, experimental models and other evidence from human participants have shown that elevated intraocular pressure (IOP) results in damage to the optic nerve in a pattern characteristic of glaucoma. Furthermore, studies have demonstrated correlations between the level of IOP and the risk of having glaucoma, as well as the worsening of glaucoma once present. Other studies have demonstrated that lowering IOP, even from “normal levels,” reduces both the incidence of glaucoma in individuals who do not have glaucoma damage but are at high risk for its development and the rate of progression of glaucoma in individuals with established glaucoma. For these reasons, as well as the fact that IOP is the only known modifiable risk factor for glaucoma, the treatments for glaucoma today all center on the reduction of IOP, which secondarily prevents the worsening of visual field loss. Treatments that lower IOP may therefore prevent visual impairment and blindness.

Definitions

The following terms related to glaucoma are used throughout this report:

Glaucoma: An optic neuropathy associated with progressive death of retinal ganglion cells and their axons, and associated visual field loss. The characteristic changes of the optic nerve head that distinguish glaucoma from other optic neuropathies include excavation and undermining of the neural and connective tissues.

Primary open-angle glaucoma (also chronic open-angle glaucoma): Glaucoma in the setting of an eye with a visibly open anterior chamber angle (between the iris and anterior sclera/peripheral cornea) and no other ocular or systemic disorder that might result in glaucoma.

Secondary open-angle glaucoma: Glaucoma in the setting of an eye with a visibly open anterior chamber angle (between the iris and anterior sclera/peripheral cornea) and some other ocular or systemic disorder that can result in glaucoma. Examples of secondary open-angle glaucomas include pigment dispersion syndrome, pseudoexfoliation syndrome, and steroid-induced glaucoma.
**Glaucoma suspect:** A nonspecific term describing someone at higher than average risk of having or developing glaucoma. In the case of open-angle glaucoma, this risk may be increased due to elevated intraocular pressure (ocular hypertension), an optic nerve with an appearance consistent with the structural changes caused by glaucoma, a significant family history of the disease, or a racial background known to confer higher rates of glaucoma. It is currently possible to estimate the risk of future glaucoma only in some patients in the ocular hypertensive group.

**Treatments for Open-Angle Glaucoma**

Medical, laser, and incisional surgical treatments are used to treat glaucoma. The most common currently used medical treatment includes several classes of eye drops, including prostaglandin analogs, beta-adrenergic antagonists, oral and topical carbonic anhydrase inhibitors, and alpha-adrenergic agonists. Laser trabeculoplasty is an office-based procedure that lowers the IOP by increasing the outflow of aqueous humor from the eye. Incisional surgery to lower the IOP comprises procedures that have been performed for decades, such as trabeculectomy and aqueous drainage device surgery, as well as a host of newer procedures, such as nonpenetrating deep sclerectomy, canaloplasty, endoscopic cyclophotocoagulation, and alternative methods of trabecular bypass.

Definitions of laser and incisional treatments follow.

**Laser trabeculoplasty:** A procedure in which laser energy (argon, YAG, diode) is applied to the trabecular meshwork in an effort to reduce the resistance to outflow for aqueous humor. The procedure is performed as part of an office visit and requires topical anesthesia and a mirrored contact lens.

**Trabeculectomy:** The most commonly performed incisional surgery for lowering intraocular pressure in glaucoma patients. Under local anesthesia, a passageway is created at the limbus (junction between the cornea and sclera) that allows the aqueous humor to flow from the anterior chamber to the space between the sclera and the conjunctiva, thereby lowering the intraocular pressure. The hallmark of a trabeculectomy is the fluid-filled bleb (blister) present on the surface of the eye underneath the upper eyelid.

**Trabeculotomy:** An incisional surgery procedure generally used to lower intraocular pressure in glaucoma affecting infants and children. A metal probe or a suture is passed into Schlemm’s canal, a structure into which aqueous humor passes as it exits the eye. The probe is used to disrupt tissue that is typically impeding outflow of aqueous humor from the eye, thereby increasing outflow and decreasing the intraocular pressure. Some surgeons also use trabeculotomy in the treatment of glaucoma in adults.

**Aqueous drainage devices:** Any of a number of plastic implants used in the surgical management of glaucoma with the aim of lowering the intraocular pressure. All devices consist of a tube that is inserted into the eye and a plate connected to the tube that is sewn to the sclera and covered by conjunctiva. Aqueous humor moves through the tube and out of the eye to drain on top of the plate into the space between the plate and the conjunctiva.

**Cyclophotocoagulation:** A procedure in which laser energy is used to damage the ciliary processes, reducing the amount of aqueous humor that they produce and thereby lowering the intraocular pressure. The procedure can be performed through the sclera (external cyclophotocoagulation) or from the inside of the eye (endocyclophotocoagulation).

**Deep sclerectomy:** A procedure in which the surgeon makes an opening in the conjunctiva to expose the sclera. The surgeon dissects a partial-thickness flap about 5 mm in width to about one-third depth in the sclera at the limbus. A second flap is dissected below this flap in order to
leave a very thin layer of tissue and to expose Schlemm's canal. This underlying flap of scleral tissue is removed, and the surgeon grasps the roof of Schlemm's canal and removes a strip that is about 3 mm in length. Aqueous humor is able to permeate the remaining tissue without a full-thickness hole being necessary. The external flap is then sutured in its original position and the conjunctiva is sewn back in place.

**Viscocanalostomy:** A surgical procedure that is the same as for deep sclerectomy (see above) but also includes viscoelastic injected into Schlemm's canal in a circumferential fashion in an effort to dilate Schlemm's canal. The external flap is then sutured in its original position and the conjunctiva is put back in place.

**Canaloplasty:** A procedure that begins with a combined deep sclerectomy and viscocanalostomy procedure (see above), after which a microcatheter with an illuminated tip is passed through Schlemm's canal for 360 degrees. A 10-0 Prolene suture is tied to the catheter and threaded around Schlemm's canal for 360 degrees. The two ends of this suture are tied under tension in an effort to expand Schlemm's canal. The external flap is then sutured in its original position and the conjunctiva is sewn back in place.

**Trabectome™:** A procedure in which the surgeon makes a 1.7 mm incision through the peripheral cornea and injects viscoelastic into the anterior chamber. The Trabectome device is then introduced into the anterior chamber and, under visualization using direct gonioscopy with an operating microscope, the Trabectome is used to ablate about one quadrant of trabecular tissue. The Trabectome uses low-energy electrical pulses to vaporize the trabecular tissue, and aspiration is used to remove it. The viscoelastic is removed and the corneal wound is sutured closed.

**iStent™:** A device placed into Schlemm’s canal. The Glaukos Trabecular Micro-Bypass Stent (iStent) is made of nonferromagnetic titanium. One end sits in the anterior chamber and the posterior end sits in Schlemm’s canal, allowing fluid to bypass the trabecular meshwork. The device is inserted under direct visualization (using direct gonioscopy) through a 3 mm temporal clear corneal incision. After viscoelastic is placed in the anterior chamber, the applicator is passed through the incision and the device is anchored into Schlemm’s canal in the nasal angle. Viscoelastic is removed with irrigation and aspiration.

**Gold shunt:** A device that connects the anterior chamber to the suprachoroidal space. The SOLX™ Gold Shunt is a 24-karat gold rectangle (3.2 x 5.2 mm). There are two plates with grooves in them to allow flow from the higher pressure anterior chamber to the lower pressure suprachoroidal space. The conjunctiva is disinserted at the limbus, and a full-thickness scleral incision is created 2 mm posterior to the limbus. A crescent blade is used at 90 percent scleral depth to direct the anterior portion of the shunt to the anterior chamber and to cut posteriorly 2 to 3 mm to direct the posterior segment into the suprachoroidal space. The scleral incision is closed with 10-0 nylon sutures and the conjunctiva is closed.

**Methods**

**Topic Development**

The Agency for Healthcare Research and Quality (AHRQ) requested the formulation and refinement of the Comparative Effectiveness Review topic Effectiveness of Screening and Treatment for Glaucoma.

In consultation with AHRQ, we identified a small group of stakeholders to serve as members of a Key Informant group. The Key Informant group helped shape Key Questions (KQs) relevant
to the topic by providing input regarding the populations and clinical subgroups, interventions, and outcomes of interest to clinicians, policymakers, payers, and consumers.

We incorporated the Key Informants’ feedback into a draft of the KQs, analytic framework, and inclusion criteria, which was posted to the AHRQ Web site for public comment from April 22 to May 20, 2010. KQs and inclusion criteria were finalized after consideration of the public comments received.

A Technical Expert Panel (TEP) was selected to provide broad expertise and perspectives specific to the topic under development. The TEP reviewed a protocol outlining a proposed methodological approach for the completion of the Comparative Effectiveness Review, provided information to the investigators to aid in the refinement of the inclusion criteria and literature search strategies, and recommended approaches to specific issues, as requested. The final protocol, titled Comparative Effectiveness of Treatment for Open-Angle Glaucoma, was posted to the AHRQ Web site on November 16, 2010.

Analytic Framework

The analytic framework derived from the topic development phase (Figure A) is a modified version of a larger framework depicting the impact of both screening and treatment for open-angle glaucoma. The following KQs are represented in the framework.

KQ 1: Do medical, laser, and other surgical treatments for open-angle glaucoma reduce visual impairment?

KQ 2: Does treatment of open-angle glaucoma improve patient-reported outcomes?

KQ 3: Do medical, laser, and other surgical treatments for open-angle glaucoma lower intraocular pressure?

KQ 4: Do medical, laser, and other surgical treatments for open-angle glaucoma prevent or slow the progression of optic nerve damage and visual field loss?

KQ 5: Does lowering intraocular pressure or preventing or slowing the progression of optic nerve damage and visual field loss reduce visual impairment and change vision-related quality of life?

KQ 6: What are the harms associated with medical, laser, and other surgical treatments for open-angle glaucoma?
Search Strategy

To identify evidence relevant to the KQs in the analytic framework, we searched the following databases for primary studies: MEDLINE®, Embase, LILACS (Latin American and Caribbean Literature on Health Sciences), and CENTRAL (the Cochrane Central Register of Controlled Trials). We developed a search strategy for MEDLINE, accessed via PubMed, based on an analysis of the medical subject heading (MeSH) terms and text words of key articles identified a priori and adapted this search strategy for searches of Embase (using EMTREE terms) and CENTRAL. We searched the literature without imposed language, sample size, or date restrictions, but excluded non-English-language studies at the time of full-text review. We searched relevant systematic reviews to identify any additional eligible articles. The search was last completed October 6, 2011.

We also conducted a search in MEDLINE and CENTRAL for systematic reviews that addressed the KQs of interest. For MEDLINE, the search included the topic strategy as noted above combined with the term “AND systematic[sb]” and was limited to systematic reviews published from 2009 to 2011. The search for systematic reviews was conducted on March 2, 2011. We screened an existing database of eye and vision systematic reviews to identify relevant open-angle glaucoma systematic reviews published prior to 2009.6

Study Inclusion Criteria

We included randomized controlled trials and quasi-randomized controlled trials of medical, laser, and incisional surgical treatments for open-angle glaucoma for inclusion as primary studies for KQs 1, 2, 3, and 4. For KQs 5 and 6, we included observational study designs, cohort studies, and case-control studies, in addition to randomized and quasi-randomized controlled trials.

We included studies of participants with primary open-angle glaucoma or open-angle glaucoma suspects. The definition of “glaucoma suspect” is not standardized, so any group in a study with this label was included. Other specific conditions that were considered to be open-
angle glaucoma were low/normal tension glaucoma, pseudoexfoliation, pigmentary glaucoma, and steroid-responsive glaucoma. In keeping with the usual clinical distinction between adult and juvenile glaucomas, only studies with participants aged 40 years and older were considered. We specifically excluded the following conditions: juvenile/congenital glaucoma, traumatic glaucoma, neovascular glaucoma, refractory glaucoma, and inflammatory glaucoma.

We excluded studies that enrolled participants with conditions other than open-angle glaucoma if they did not also analyze the open-angle glaucoma subgroup separately. We also excluded case series of less than 100 subjects, as such small sample sizes are unable to capture rates of harms of less than a few percent.

There were no limitations based on stage or severity of disease, disease etiology, comorbid ocular or other medical conditions, geographic location, or demographic characteristics (e.g., gender, race/ethnicity).

**Interventions**

We first identified treatments currently used for open-angle glaucoma and then included studies of medical (eye drops and systemic treatment), laser, and incisional surgery. The most commonly used topical medical interventions include prostaglandin analogs, beta-adrenergic blockers, alpha-adrenergic agonists, and carbonic anhydrase inhibitors. We also included the currently available combination drops (timolol-brimonidine and timolol-dorzolamide). Drugs no longer in use or not approved by the U.S. Food and Drug Administration were specifically excluded.

Studies of the impact of medical intervention on circadian intraocular pressure were included if outcomes were assessed over a 24-hour period and participants were admitted to a hospital, sleep laboratory, or other facility overnight.

In terms of office-based laser treatments for open-angle glaucoma, we included studies of laser trabeculoplasty without regard to the technology used (argon, diode, YAG).

We also searched for studies evaluating the currently used incisional surgeries: trabeculectomy, aqueous drainage devices, deep sclerectomy, and viscocanalostomy. Because of surgeons’ desire to find a more predictable procedure for lowering intraocular pressure, there has been a proliferation of new specialized devices intended to treat open-angle glaucoma. To assess the evidence for or against their use, studies of the iScience microcatheter, the Trabectome, the ExPRESS shunt, the Glaukos iStent, and the SOLX Gold Shunt were included.

Because glaucoma frequently is managed simultaneously with cataract, we included studies of combined cataract and glaucoma surgical procedures published after April 2000. Studies published prior to this period are summarized in the AHRQ report titled Surgical Treatment of Coexisting Cataract and Glaucoma.7

**Article Screening and Abstraction**

We screened potentially relevant citations (primary studies and systematic reviews) using the Web-based systematic review software DistillerSR (http://systematic-review.net/). Citations identified by the search strategies were uploaded to DistillerSR before two reviewers independently assessed titles and abstracts according to the inclusion criteria. We classified the titles and abstracts as “include,” “exclude,” or “unsure.” Disagreements about eligibility were resolved through discussion among reviewers.

Citations tagged as “unsure” by both reviewers, “unsure” by one reviewer and “include” by the other, or “include” by both reviewers were carried forward to full-text screening. Two
reviewers independently applied the same inclusion criteria as used during abstract screening. Non-English-language articles were removed from further consideration at this stage. We resolved any disagreements regarding inclusion through discussion or, as needed, adjudicated unresolved conflicts during a team meeting.

Data abstraction forms were designed and pilot tested. For studies included at the full-text stage, one reviewer extracted descriptions of the study, including details about the population, intervention(s), and outcomes of interest, using the systematic review software DistillerSR. A second reviewer verified the data. We again resolved disagreements through discussion.

**Comparators**

KQs 1, 2, 3, 4, and 6 explored comparisons of medical, laser, and incisional surgical treatments for open-angle glaucoma with each other (e.g., medical vs. laser, medical vs. medical) or with no treatment (placebo). For KQs 1, 2, 3, 4, and 6, we also included studies in which the intervention was a laser or incisional surgical treatment for glaucoma but the comparator was a combined or staged procedure for cataract and glaucoma (glaucoma surgical treatments combined or staged with phacoemulsification or extracapsular cataract extraction).

**Outcomes**

For KQ 1, the outcome is the proportion of participants with moderate, severe, and profound visual impairment as defined in the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). The ICD-9 criteria define moderate visual impairment as best corrected visual acuity of between 20/70 and 20/160, severe visual impairment as acuity between 20/200 and 20/400 or a visual field of 20 degrees or less, and profound visual impairment as an acuity of 20/500 to 20/1000 or no more than 10 degrees of visual field. We also planned to consider any other nonstandard measurements of visual impairment as defined by included studies. We included visual acuity outcomes among the treatment groups of interest (Early Treatment of Diabetic Retinopathy Study or Snellen) as reported in included studies (e.g., mean visual acuity or proportion of participants in prespecified visual acuity categories).

KQ 2 deals with patient-reported outcomes, so we considered participants’ mean total or relevant item/subscale scores as measured by any validated questionnaire (e.g., National Eye Institute Visual Function Questionnaire [NEI-VFQ]). To be considered, an instrument had to address the primary outcome of vision-related quality of life (primary outcome) or the secondary outcomes of treatment convenience, patient satisfaction, patient preference or utility, or adherence with medication.

KQ 3 addresses the ability of treatment to lower intraocular pressure. As standard outcomes, we included the proportion of participants with intraocular pressure measurements at the prespecified levels of ≤18 mmHg or ≥20-percent decrease in intraocular pressure from baseline levels. Since the analysis of intraocular pressure may vary appreciably by trial, we planned to consider other intraocular pressure outcomes as reported in included studies.

To assess the ability of treatments to reduce either visual field loss or optic nerve structural damage (KQ 4), we used two standard outcomes: the proportion of participants with progressive optic nerve damage as defined by included studies and as observed via fundus photography or other imaging of the posterior pole, and the proportion of participants with progression of visual field loss as defined by the Early Manifest Glaucoma Trial and as measured via automated threshold perimetry. We also planned to consider other assessments of visual field loss as defined by included studies.
KQ 5 explores the association between (1) lowering intraocular pressure or (2) preventing or slowing the progression of optic nerve damage and visual field loss (intermediate outcomes of treatment) and final health outcomes (reduced visual impairment and improved vision-related quality of life) among the populations of interest. The outcomes for KQ 5 were therefore the same as those described above for KQs 1, 2, 3, and 4.

Finally, we compared the proportion of participants experiencing the following adverse events among the treatment groups of interest:

Potentially serious:
- Cataract formation (visually significant cataract requiring surgery or report of cataract surgery)
- Low intraocular pressure (hypotony)
- Decreased visual acuity
- Infection (e.g., blebitis, endophthalmitis)
- Inflammation
- Strabismus
- Peripheral anterior synechiae
- Retinal tear and detachment
- Systemic allergic reaction
- Loss of an eye
- Need for additional surgery
- Hyphema
- Transient decrease in central vision
- Systemic side effects
- Choroidal detachment, effusion, hemorrhage
- Cardiac arrhythmia
- Death

Less likely to be serious:
- Eye irritation
- Eye watering
- Eye redness
- Patient discomfort
- Ocular surface disease
- Other patient complaint
- Skin discoloration
- Conjunctival injection
- Iris color change
- Punctal stenosis
- Conjunctival foreshortening

We assessed medical treatment outcomes at a minimum of 1 month postintervention. We included outcomes reported at 6 months (2–9 months) and 1 year (10–18 months) as reported in included studies. The exception was circadian medical treatment studies in which the investigators reported outcomes assessed over a 24-hour period. For studies of surgical
interventions, we assessed outcomes at a minimum of 1 year (10–18 months) and at annual intervals thereafter as reported in included studies.

**Risk-of-Bias Assessment**

We used the Cochrane Collaboration’s tool for assessing the risk of bias of randomized and quasi-randomized trials. Two reviewers assessed the included studies for sources of systematic bias according to the guidelines in Chapter 8 of the Cochrane Handbook for Systematic Reviews of Interventions and evaluated the studies for the following criteria: sequence generation and allocation concealment (selection bias); masking of participants, study investigators, and outcome assessors (detection bias); incomplete outcome data (attrition bias); selective outcome reporting (reporting bias); and other sources of bias. Masking of investigators and participants was not possible with some of the interventions examined but was noted when mentioned. We reported judgments for each criterion as “low risk of bias,” “high risk of bias,” or “unclear risk of bias (information is insufficient to assess).” The two reviewers resolved disagreements through discussion.

Two reviewers assessed the methodological rigor of observational studies using a modified version of the Newcastle Ottawa Scale. The Newcastle Ottawa Scale includes domains to assess the quality of study group selection (representativeness, selection, case definitions); comparability of cohorts/cases and controls on the basis of the design or analysis; and ascertaintment of exposures or outcomes, adequacy of followup, nonresponse rate, and financial or other conflicts of interest. Each item query required a “yes,” “no,” or “unable to determine/not reported” response. In addition, reviewers provided an overall assessment of the quality of each study as “good,” “fair,” or “poor” using the reporting bias, selection bias, and confounding domains as a basis for the assessment.

We used a tool adapted by Li (2010) from the Critical Appraisal Skills Program, Assessment of Multiple Systematic Reviews (AMSTAR), and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement to assess the methodological quality of systematic reviews. We used the following criteria, adapted from Li, to determine which systematic reviews were of sufficient quality to be considered for inclusion in this review: comprehensive search for primary studies (searches of more than one bibliographic database), risk-of-bias assessment, appropriate methods of analysis.

**Rating the Evidence**

We assessed the quantity, quality, and consistency of the body of available primary study evidence addressing KQs 1 through 6. We used an evidence grading scheme recommended by the GRADE (Grading of Recommendations Assessment, Development and Evaluation) Working Group, adapted by AHRQ in the Methods Guide for Effectiveness and Comparative Effectiveness Reviews (www.effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=328) and published in the Journal of Clinical Epidemiology.

Although we included systematic reviews that addressed our KQs and considered systematic reviews as the highest level of evidence for addressing questions of therapy, we were unable to adapt the evidence grading scheme to incorporate evidence from systematic reviews. We assessed the quality and consistency of the best available primary study evidence, including assessment of the risk of bias in relevant studies, as well as aspects of consistency, directness, and precision as described in the Methods Guide for Effectiveness and Comparative
Effectiveness Reviews and by Owens et al. (2010). For each outcome of interest, two reviewers graded the major outcomes for each KQ and then the entire team discussed their recommendations and reached consensus.

Data Synthesis

When we identified existing systematic reviews of sufficient quality (based on the criteria outlined in Rating the Evidence) that addressed the KQs, we cited these reviews as evidence and did not abstract and synthesize data from the studies incorporated in those reviews. We abstracted evidence from additional primary studies for interventions, comparisons, and outcomes that were not addressed by existing systematic reviews, and we searched for and summarized evidence from additional primary studies that were published or identified after the date of the last search conducted for the systematic review. We adapted the recommendations of Whitlock et al. (2008) for incorporating systematic reviews in complex reviews. They recommend providing a narrative summary of the review methods (i.e., inclusion/exclusion criteria, search strategy, statistical methodology) and findings (i.e., number of studies included, quantitative and qualitative results), and, in the instance of multiple reviews, providing an evaluation of the consistency across reviews that addressed the same KQ.

Due to appreciable variability in interventions, followup intervals, or assessments of outcomes, we did not combine the results of primary studies in a meta-analysis and instead present a narrative summary. The plan for the analysis of primary studies, including the assessments of heterogeneity, reporting bias, measures of treatment effect, data synthesis, and subgroup analysis, was included in the protocol for this review.

Results

Our major findings are summarized by KQ. Table A provides a summary of the key points.

Medical Treatment of Open-Angle Glaucoma

KQ1a: Comparative Effectiveness of Medical Treatments for Reducing Visual Impairment

- No studies of medical therapy were identified that directly addressed outcomes related to visual impairment.
- The available studies addressing the secondary outcomes of change in visual acuity and change in visual field loss are of too short a duration to answer this question, given that glaucoma is typically a slowly progressive disease that may take many years to cause clinically or statistically significant changes.

KQ3a: Comparative Effectiveness of Medical Treatments for Lowering Intraocular Pressure

- Prostaglandins lower IOP more than dorzolamide (carbonic anhydrase inhibitor, 2.64 mmHg, three trials), brimonidine (alpha-adrenergic agonist, 1.64 mmHg, four trials), and timolol (beta-adrenergic blocker, 5 percent lower at 6 months, four trials) (systematic review).
- The prostaglandins appear similar in the extent to which they lower IOP, but some studies have reported a greater drop in IOP with bimatoprost (prostaglandin) (systematic review).
- The combination dorzolamide/timolol appears to lower IOP the same amount as prostaglandins (systematic review).

**Circadian Intraocular Pressure**
- Our conclusions regarding the effect of topical therapies in lowering IOP over the 24-hour time period were limited due to the fact that one study provided almost all of the data.
- All topical medications reviewed appear to lower IOP throughout the 24-hour cycle.
- Prostaglandins appear to lower IOP more over the 24-hour cycle than beta-blockers, topical carbonic anhydrase inhibitors, and alpha agonists, but the evidence for this is weak.
- While the IOP-lowering effects of different prostaglandins appear to vary appreciably over the 24-hour time period, the results were inconsistent and the reported difference in the amount of IOP lowering was on the order of 1 mmHg.
- Results from systematic reviews comparing one prostaglandin with another were inconsistent.

**KQ4a: Comparative Effectiveness of Medical Treatments for Preparing or Slowing the Progression of Optic Nerve Damage and Visual Field Loss**
- A systematic review of medical treatment for glaucoma determined treatment to be protective against progressive visual field loss. This review included the results of both the Early Manifest Glaucoma Trial and the Ocular Hypertension Treatment Study.
- Other included primary studies were of insufficient size or duration to detect differences in the rates of optic nerve damage or visual field loss. Given the slowly progressive nature of glaucoma, the large trials of glaucoma therapy have demonstrated the need to follow hundreds of participants for 5 or more years to detect change.
- A single study addressed the comparative effectiveness of glaucoma medications with respect to their ability to prevent optic nerve damage or visual field loss and found brimonidine superior to timolol.

**KQ6a: Harms Associated With Medical Treatments for Open-Angle Glaucoma**
- The prostaglandin agents produce more ocular redness than does timolol (beta-adrenergic blocker) (systematic review).
- Within the prostaglandins, latanoprost is least likely to cause redness (systematic review).
- Subjects on timolol (beta-blocker) were less likely to drop out of studies due to side effects than those on brimonidine (alpha-adrenergic agonist), latanoprost (prostaglandin analog), travoprost (prostaglandin analog), or betaxolol (beta-blocker) (systematic review).
Surgical Treatment of Open-Angle Glaucoma

KQ1b: Comparative Effectiveness of Laser and Other Surgical Treatments for Reducing Visual Impairment

- No studies reported on the outcome of visual impairment after laser or other surgical treatments.
- Visual acuity was not assessed as a primary outcome in any identified study comparing laser with other surgical treatments for glaucoma. Visual acuity was only irregularly reported, if at all.
- Given the limitations above, no treatment appeared to have a greater effect on visual acuity than any other treatment.

KQ3b: Comparative Effectiveness of Laser and Other Surgical Treatments for Lowering Intraocular Pressure

- Trabeculectomy lowers IOP more than nonpenetrating surgeries (systematic review).
- The use of mitomycin-C intraoperatively with trabeculectomy results in lower IOP than when it is not used (systematic review).
- Other alterations in surgical technique, location of surgery on the eye, and adjuvants other than mitomycin-C have not been shown to result in an added pressure decrease (primary studies).
- The IOP-lowering effect of combined cataract surgery and trabeculectomy is not affected by the location of the conjunctival incision or the presence or absence of a peripheral iridectomy but may be more in two-site (cataract and trabeculectomy performed using different incisions) than one-site (cataract and trabeculectomy performed using the same incision) surgery (systematic review).
- Laser trabeculoplasty effectively lowers IOP in glaucoma patients, and effectiveness does not vary with the type of laser used (primary studies).
- The data available on the role of aqueous drainage devices in open-angle glaucoma are inadequate to draw conclusions (primary studies, systematic review).

KQ4b: Comparative Effectiveness of Laser and Other Surgical Treatments for Preventing or Slowing the Progression of Optic Nerve Damage and Visual Field Loss

- No studies comparing laser and surgical treatments were found that reported data on whether these procedures slow the progression of optic nerve damage and visual field loss.

KQ6b: Harms Associated With Laser and Other Surgical Treatments for Open-Angle Glaucoma

- Trabeculectomy results in more complications than nonpenetrating surgeries (systematic review).
- The profile of harms does not differ between one- and two-site combined cataract and glaucoma surgery (systematic review).
Medical Versus Surgical Treatment of Open-Angle Glaucoma

KQ1c: Comparative Effectiveness of Medical Versus Surgical Treatment for Reducing Visual Impairment

- Although trabeculectomy may reduce the risk of vision loss compared to medical treatment after adjusting for demographic and comorbid factors, the body of evidence is limited and inconclusive (systematic review).

KQ3c: Comparative Effectiveness of Medical Versus Surgical Treatment for Lowering Intraocular Pressure

- Incisional surgery lowers IOP more than lasers or medications (systematic review).
- Initial treatment with lasers tends to reduce the need for medications to achieve a given IOP (systematic review).

KQ4c: Comparative Effectiveness of Medical Versus Surgical Treatment for Preventing or Slowing the Progression of Optic Nerve Damage and Visual Field Loss

- Trabeculectomy may prevent more visual field loss than medicines when used as initial therapy in advanced glaucoma (systematic review).
- The Collaborative Initial Glaucoma Treatment Study (CIGTS) included current surgical techniques and medications, and found no difference in change in visual field (but did not report on change in the optic nerve).
- Treatment of ocular hypertension with medicines preserves visual fields better than no treatment (systematic review).

KQ6c: Harms Reported in Studies of Medical Versus Surgical Treatments for Open-Angle Glaucoma

- Trabeculectomy is associated with cataract worsening and an increased need for cataract surgery over time when compared to medical treatments for glaucoma (systematic review).
- Intraocular surgery rarely results in severe vision loss due to infection and/or bleeding. These risks are not associated with medical or laser treatments.
- Laser trabeculoplasty can produce peripheral anterior synechiae, whereas medical treatment does not (systematic review).

Additional KQs

KQ2: Improvement in Patient-Reported Outcomes With Treatment of Open-Angle Glaucoma

- There is no direct evidence regarding the impact of glaucoma treatment on patient-reported outcomes.
- Medical and surgical treatments reduce the patient’s fear of blindness.
- Several studies suggest that the type of glaucoma treatment does not have an influence on quality of life.
• There is some evidence that, among medical treatments, patients prefer those that are less frequently applied.
• Since there are unlikely to be any future trials with a placebo arm, it will not be possible to determine definitively if treatments improve patient-reported outcomes relative to no treatment. It will still be possible to compare the effectiveness of different treatments on patient-reported outcomes, however.

KQ5: Effect of Lowering IOP or Preventing or Slowing the Progression of Optic Nerve Damage and Visual Field Loss on Visual Impairment and Vision-Related Quality of Life

• We found no good-quality studies addressing the relationship between the intermediate outcomes of IOP reduction, prevention of optic nerve damage, or prevention of visual field loss and the outcomes of visual impairment and vision-related quality of life.

Future Research

The available evidence demonstrates definitively that intraocular pressure can be lowered by medications, laser treatments, and surgery. High-quality randomized controlled trials have also shown that reduction of intraocular pressure slows the development and progression of damage to the optic nerve and slows visual field loss. Although it is logical to presume that slowing glaucoma damage would lead to preservation of vision-related quality of life and reduction in visual impairment, this link has not been demonstrated in the research literature.

One specific area that would benefit from research is the association between treatment and visual impairment and/or patient-reported outcomes. One important reason such work has not yet been done is that the time from diagnosis to visual impairment in a treated glaucoma patient may be many years to decades. Nevertheless, such a link is important to establish.

Another general area that requires additional evidence is the relative risks and benefits of medical and surgical treatments for glaucoma. The number of studies that adequately compare two or more treatments over time is too small to draw any significant conclusions about the comparative effectiveness of most currently used therapies.

As a general comment on the available literature on glaucoma treatments, the field would benefit from more rigorous study design and more standardized reporting of outcomes. The World Glaucoma Association publication Guidelines on Design and Reporting of Glaucoma Surgical Trials should serve as a basis for all trials of new and existing treatments.15
<table>
<thead>
<tr>
<th>KQ</th>
<th>Outcomes</th>
<th>Studies Included</th>
<th>Comparators</th>
<th>Main Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Visual impairment</td>
<td>Systematic Reviews: Medical: 0, Surgical: 2, Medical-surgical: 1</td>
<td>Surgical Systematic Reviews: 1 vs. 2-site phacotrabeculectomy Endocyclophotocoagulation vs. Ahmed valve Molteno implant vs. no implant</td>
<td>- No statistically significant differences between surgical treatments.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Visual acuity</td>
<td>Primary Studies: Medical: 11, Surgical: 4, Medical-surgical: 0</td>
<td>Medical RCTs: Timolol vs. brimonidine vs. travoprost Timolol vs. carteolol Timolol vs. levobunolol Levobunolol vs. betaxolol Levobunolol vs. untreated Crossover: Dorzolamide + timolol, travoprost vs. latanoprost Laser vs. medical</td>
<td>- Although it appears that trabeculectomy may reduce the risk of vision loss after adjusting for demographic and comorbid factors, the body of evidence is limited and inconclusive.</td>
<td></td>
</tr>
<tr>
<td>KQ1</td>
<td></td>
<td></td>
<td>Surgical RCTs: Trabeculectomy vs. Ex-press shunt Trabeculectomy vs. NPDS with hyaluronic acid implant NPDS +/- MMC NPDS +/- collagen implant</td>
<td>- No studies reported on visual impairment after laser or other surgical treatments. We could not determine whether individual patients sustained a clinically important decrease in visual acuity, because in all our identified studies comparing laser and other surgical treatments for glaucoma, visual acuity outcomes were reported as a mean value and not assessed as a primary outcome. No single treatment appeared to have a greater effect on visual acuity than any other treatment.</td>
<td>Medical studies: Insufficient Surgical studies: Low</td>
</tr>
</tbody>
</table>
Table A. Summary of outcomes, comparators, and main results by KQ (continued)

<table>
<thead>
<tr>
<th>KQ</th>
<th>Outcomes</th>
<th>Studies Included</th>
<th>Comparators</th>
<th>Main Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>KQ2</td>
<td>Patient-reported outcomes:</td>
<td>Systematic Reviews</td>
<td>Medical-Surgical Systematic Reviews</td>
<td>• Not analyzed separately from primary reviews.</td>
<td>For all outcomes:</td>
</tr>
<tr>
<td></td>
<td>Quality of life</td>
<td>Medical: 0</td>
<td>Laser vs. medical</td>
<td></td>
<td>Insufficient</td>
</tr>
<tr>
<td></td>
<td>Fear of blindness</td>
<td>Surgical: 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Patient preference</td>
<td>Medical-surgical: 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Patient satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary Studies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical: 4</td>
<td>Medical RCTs</td>
<td>• There is no evidence that treatment of glaucoma improves patient-reported</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surgical: 0</td>
<td>Brimonidine vs. timolol</td>
<td>outcomes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical-surgical: 2</td>
<td>Timolol + dorzolamide vs. timolol + brimonidine</td>
<td>• There is little evidence that the treatments themselves influence patient QOL.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Timolol + dorzolamide vs. latanoprost</td>
<td>• The type of treatment does not have an influence on QOL.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Timolol gel vs. timolol solution</td>
<td>• Among medical treatments, patients prefer the treatment that is less</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>frequently applied.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Medical-Surgical RCTs</td>
<td>One high-quality RCT shows that glaucoma treatment reduces fear of blindness</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Trabeculectomy +/- 5FU vs. beta-blockers</td>
<td>regardless of the type of treatment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Betaxolol + ALT vs. no treatment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table A. Summary of outcomes, comparators, and main results by KQ (continued)

<table>
<thead>
<tr>
<th>KQ</th>
<th>Outcomes</th>
<th>Studies Included</th>
<th>Comparators</th>
<th>Main Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
</table>
| KQ3  | Reduction of intraocular pressure       | Systematic Reviews                                    | Medical Systematic Reviews                                                   | • Prostaglandins lower IOP better than dorzolamide, brimonodine, and timolol.  
  • The prostaglandins appear similar in the extent at which they lower IOP, but some studies have reported a greater drop in IOP with bimataprost.  
  • The combination dorzolamide/timolol has similar effect as prostaglandins. | Low                  |
|      |                                         | Medical: 9 Circadian IOP: 3 Surgical: 9 Medical-surgical: 2 | Latanoprost vs. bimatoprost, timolol vs. travoprost, latanoprost vs. dorzolamide + timolol, latanoprost vs. brimonodine, latanoprost vs. dorzolamide, latanoprost vs. bimatoprost vs. travoprost, comparison of prostaglandin analogs, timolol vs. brimonodine, timolol vs. latanoprost |                                                                                                                                            |                      |
|      |                                         | Systematic-Surgical Systematic Reviews                | Medical-Surgical Systematic Reviews                                          | • IOP of participants randomized to trabeculectomy is lower than participants receiving medical treatment at 1 year.  
  • The risk of failure was lower with argon laser trabeculoplasty compared to medical treatment.                                                                                                       | Moderate             |
|      |                                         | Medical treatment vs. surgical treatment              |                                                                                                                                           |                                                                                                                                            |                      |
|      |                                         | Circadian IOP Systematic Reviews                     | Comparison of prostaglandin analogs                                          | • Results from systematic reviews comparing one prostaglandin to another were inconsistent.                                                                                                                |                      |
|      |                                         | Latanoprost vs. dorzolamide + timolol latanoprost vs. bimatoprost |                                                                                                                                           |                                                                                                                                            |                      |
|      |                                         | Surgical Systematic Reviews                          | Surgical Systematic Reviews                                                  | • Trabeculectomy lowers IOP more effectively than nonpenetrating filtering surgeries.  
  • Fewer deep sclerectomy patients and argon laser trabecuoplasty patients than trabeculectomy patients achieved complete success.  
  • The addition of antimetabolites to trabeculectomy significantly reduced IOP among participants, as did receiving postoperative 5-FU.  
  • The addition of beta radiation to trabeculectomy does not appear to reduce IOP more than trabeculectomy alone.                                                                 |                      |
<table>
<thead>
<tr>
<th>KQ</th>
<th>Outcomes</th>
<th>Studies Included</th>
<th>Comparators</th>
<th>Main Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
</table>
| KQ3 | Reduction of intraocular pressure                | Primary Studies  
Medical: 46 retrieved,  
0 included for analysis  
Circadian IOP: 5  
Surgical: 20  
Medical-surgical: 2 | Circadian IOP RCTs  
Latanoprost vs. bimatoprost  
Latanoprost vs. timolol vs. brimonidine  
Latanoprost vs. dorzolamide vs. timolol  
Latanoprost vs. bimatoprost vs. travoprost | • Conclusions were limited due to the fact that 1 study contained the majority of the data.  
• All topical medications reviewed lowered IOP throughout 24-hour cycle.  
• Prostaglandins appear to lower IOP more over the 24-hour cycle than beta blockers, topical carbonic anhydrase inhibitors, and alpha agonists, but the evidence for this is weak.  
• While the IOP-lowering effects of prostaglandins appear to vary appreciably over the 24-hour time period, the results were inconsistent and the reported difference was small. | Low  
Surgical studies:  Moderate |
|    |          |                                                      | Surgical RCTs  
Trabeculectomy with adjuvants  
(MMC--5FU-ologen implant-amniotic graft-polytetrafluoroethylene membrane)  
Trabeculectomy techniques and variations (NPDS-Ex-Press shunt-Minitrab)  
Trabeculectomy with combined techniques (viscocanalostomy-iridectomy-formix vs. limbus)  
Combined cataract-glaucoma surgery  
Laser trabeculoplasty | | | |
|    |          |                                                      | Medical-Surgical RCTs  
Medical treatment v.s trabeculectomy | • Trabeculectomy lowers IOP.  
• The use of MMC intraoperatively with trabeculectomy results in lower IOP than when it is not used.  
• Other alterations in surgical technique, location of surgery, and adjuvants other than MMC have not been shown to result in an added pressure decrease.  
• Trabeculectomy lowers IOP more than nonpenetrating surgeries.  
• The location of the conjunctival incision or the presence or absence of a peripheral iridectomy has no effect on how much combined cataract surgery and trabeculectomy lowers IOP.  
• 2-site surgery might produce an added pressure drop over 1-site surgery.  
• Laser trabeculoplasty effectively lowers IOP in glaucoma subjects; effectiveness does not seem to vary with the type of laser used.  
• The data available for the role of aqueous drainage devices in OAG are inadequate to draw conclusions. | |
Table A. Summary of outcomes, comparators, and main results by KQ (continued)

<table>
<thead>
<tr>
<th>KQ</th>
<th>Outcomes</th>
<th>Studies Included</th>
<th>Comparators</th>
<th>Main Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>KQ4</td>
<td>Visual fields loss</td>
<td>Systematic Reviews&lt;br&gt;Medical: 1&lt;br&gt;Surgical: 0&lt;br&gt;Medical-surgical: 3</td>
<td>Medical Systematic Reviews&lt;br&gt;Medical treatment vs. surgical treatment</td>
<td>- Medical treatment for glaucoma is protective against visual field loss. (It included the results of both the Early Manifest Glaucoma Trial and the Ocular Hypertension Treatment Study.)</td>
<td>Medical: Low&lt;br&gt;Surgical: Insufficient&lt;br&gt;Medical-surgical: Insufficient</td>
</tr>
</tbody>
</table>
|     | Optic nerve damage | Medical Vs. Surgical Systematic Reviews<br>Trabeculectomy vs. medical treatment<br>Medical or surgical vs. no treatment | Medical Vs. Surgical Systematic Reviews<br>Medical Systematic Reviews<br>Surgical: 0<br>Medical-surgical: 3 | - Medically and/or surgically treated patients were less likely to experience progression of field loss and optic disc damage when compared with participants receiving no treatment.  
- Some trials showed that progression was more likely in medically treated participants than in participants randomized to laser trabeculectomy or trabeculectomy. | |
|     |               | Primary Studies<br>Medical: 19<br>Surgical: 0<br>Medical-surgical: 1 | Medical RCTs<br>Timolol vs. brimonidine vs. travoprost<br>Timolol vs. metipranolol vs. carteolol<br>Timolol vs. carteolol<br>Timolol vs. latanoprost<br>Timolol vs. betaxolol<br>Latanoprost vs. bimatoprost<br>Latanoprost vs. travoprost vs. dorzolamide + timolol | • Most other included medical studies are too small or too short to be conclusive.  
• No surgical studies presented conclusive data.  
• Treatment of ocular hypertension with medicines preserves visual fields better than no treatment. | |
|     |               | Medical-Surgical RCTS<br>Topical hypotensives vs. observation after surgery | Medical or surgical vs. no treatment | - Trabeculectomy first may lead to better preservation of visual field than medicines first in more advanced glaucoma.  
- The Collaborative Initial Glaucoma Treatment Study included surgical techniques and medications that are current and found no difference in change in visual field (and did not report on change in the optic nerve).  
- Treatment of ocular hypertension with medicines preserves visual fields better than no treatment. | |

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Table A. Summary of outcomes, comparators, and main results by KQ (continued)

<table>
<thead>
<tr>
<th>KQ</th>
<th>Outcomes</th>
<th>Studies Included</th>
<th>Comparators</th>
<th>Main Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>KQ5</td>
<td>Quality of life</td>
<td>Systematic Reviews&lt;br&gt;Medical: 0&lt;br&gt;Surgical: 0&lt;br&gt;Medical-Surgical: 0</td>
<td>N/A</td>
<td>• We did not identify any systematic reviews that address the relationship between the intermediate outcomes of IOP reduction, prevention of optic nerve damage, or prevention of visual field loss and the outcomes of visual impairment and vision-related QOL.</td>
<td>Insufficient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary RCTs&lt;br&gt;Medical: 1&lt;br&gt;Surgical: 0&lt;br&gt;Medical-surgical: 0&lt;br&gt;Primary&lt;br&gt;Observational Studies&lt;br&gt;Medical: 1&lt;br&gt;Surgical: 0&lt;br&gt;Medical-surgical: 0</td>
<td>Medical treatment in general</td>
<td>• There are no well-executed studies addressing the relationship between the intermediate outcomes of IOP reduction, prevention of optic nerve damage, or prevention of visual field loss and the outcomes of visual impairment and vision-related QOL.</td>
<td></td>
</tr>
</tbody>
</table>
### Table A. Summary of outcomes, comparators, and main results by KQ (continued)

<table>
<thead>
<tr>
<th>KQ</th>
<th>Outcomes</th>
<th>Studies Included</th>
<th>Comparators</th>
<th>Main Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
</table>
| KQ6  | Harms             | **Systematic Reviews** Medical: 11  
Surgical: 8  
Medical-surgical: 2 | Medical Systematic Reviews  
Latanoprost vs. bimatoprost  
Latanoprost vs. bimatoprost vs. travoprost  
Latanoprost vs. dorzolamide + timolol  
Latanoprost vs. brimonidine  
Travoprost vs. latanoprost, bimatoprost, timolol  
Timolol vs. brimonidine  
Timolol vs. latanoprost | • A systematic review found that subjects on timolol were less likely to drop out of studies due to side effects than those on brimonidine, latanoprost, travoprost, or betaxolol.  
**Surgical Systematic Reviews**  
Compare the efficacy and safety profile of viscocanalostomy  
Nonpenetrating filtering surgery  
Beta radiation during trabeculectomy  
1-site phacotrabeculectomy vs. 2-site phacotrabeculectomy  
Intraoperative MMC during trabeculectomy—placebo during trabeculectomy  
Postoperative injections of 5FU | Grading not completed due to heterogeneity in outcomes and comparisons across studies |
|      |                   |                                                                                 | Surgical Systematic Reviews  
Compare the efficacy and safety profile of viscocanalostomy  
Nonpenetrating filtering surgery  
Beta radiation during trabeculectomy  
1-site phacotrabeculectomy vs. 2-site phacotrabeculectomy  
Intraoperative MMC during trabeculectomy—placebo during trabeculectomy  
Postoperative injections of 5FU | • Adverse effects were experienced more often by participants randomized to trabeculectomy than by participants randomized to other nonpenetrating filtering surgeries.  
• Harms were reported for the addition of antimetabolites to primary trabeculectomy.  
• The addition of beta radiation to trabeculectomy resulted in significantly higher risk of cataract when compared with trabeculectomy alone.  
• The harms associated with glaucoma drainage devices have not been adequately compared with the harms of other procedures in the treatment of OAG. |                                                                                     |
Table A. Summary of outcomes, comparators, and main results by KQ (continued)

<table>
<thead>
<tr>
<th>KQ</th>
<th>Outcomes</th>
<th>Studies Included</th>
<th>Comparators</th>
<th>Main Results</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>KQ6</td>
<td>Harms</td>
<td>Primary RCTs Medical: 17 Surgical: 22 Medical-surgical: 2 Primary Observational Studies Medical: 10 Surgical: 3 Medical-surgical: 0</td>
<td>Medical&lt;br&gt;Timolol vs. brimonidine vs. travoprost&lt;br&gt;Timolol vs. metipranolol vs. carteolol&lt;br&gt;Timolol vs. carteolol&lt;br&gt;Timolol vs. latanoprost&lt;br&gt;Timolol vs. betaxolol&lt;br&gt;Latanoprost vs. bimatoprost&lt;br&gt;Latanoprost vs. travoprost vs. dorzolamide + timolol&lt;br&gt;Topical hypotensives vs. observation&lt;br&gt;Latanoprost vs. bimatoprost&lt;br&gt;Latanoprost vs. timolol vs. brimonidine&lt;br&gt;Latanoprost vs. dorzolamide vs. timolol&lt;br&gt;Surgical&lt;br&gt;Trabeculectomy with adjuvants (MMC, 5FU, ologen implant, polyletrafluoroethylene membrane-amniotic graft)&lt;br&gt;Trabeculectomy techniques and variations (NPDS, Ex-Press shunt)&lt;br&gt;Trabeculectomy with combined techniques (viscocanalostomy, iridectomy, fornix vs. limbus)&lt;br&gt;Combined cataract + glaucoma surgery&lt;br&gt;Laser trabeculoplasty&lt;br&gt;NPDS +/- MMC&lt;br&gt;NPDS +/- collagen implant&lt;br&gt;Medical vs. Surgical&lt;br&gt;Trabeculectomy vs. medical treatment&lt;br&gt;Medical or surgical vs. no treatment</td>
<td>• The prostaglandin agents produce more ocular redness than timolol does.&lt;br&gt;• Within the prostaglandins, latanoprost is less likely to cause redness.&lt;br&gt;• The profile of harms does not differ between 1- and 2-site combined cataract and glaucoma surgery.&lt;br&gt;• Reports of adverse effects across studies that addressed questions related to combined surgery for coexisting cataract and glaucoma varied by intervention under consideration.&lt;br&gt;• Harms were not covered in a systematic fashion in the primary studies.</td>
<td>Grading not completed due to heterogeneity in outcomes and comparisons across studies</td>
</tr>
</tbody>
</table>

5FU = 5-Fluorouracil; ALT = argon laser trabeculoplasty; IOP = intraocular pressure; KQ = Key Question; MMC = mytomycin; NPDS = nonpenetrating deep sclerectomy; OAG = open-angle glaucoma; QOL = quality of life; RCT = randomized controlled trial
References


Introduction

The Agency for Healthcare Research and Quality Effective Health Care Program requested a comparative effectiveness review of various treatment options for glaucoma. The topic was selected through the Effective Health Care Program nomination process and from a review of the scientific medical literature.

Background

Glaucoma is a leading cause of visual impairment and blindness both in the United States and worldwide. It is estimated to affect 60.5 million people worldwide. Glaucoma is defined as an acquired disease of the optic nerve (neuropathy), characterized by a particular appearance of the optic nerve and by visual field defects that are usually midperipheral and in the nasal visual field. Depending upon whether the optic nerve damage is associated with an open or closed appearance to the drainage channels for aqueous humor in the front of the eye, the glaucoma is referred to as open angle (the subject of this report) or closed-angle.

Mild glaucoma damage to the optic nerve may be asymptomatic, but as the damage worsens, the patient begins to have difficulty with peripheral vision, contrast sensitivity, glare, and adjusting from light to dark and dark to light — symptoms that eventually affect day to day function and quality of life. In its most severe form, glaucoma results in total, irreversible blindness.

Although deficient blood supply to the optic nerve, inadequate structural support for the neurons that make up the optic nerve, and insufficient supplies of neurotrophins needed to maintain the health of the optic nerve have been hypothesized as risk factors for glaucoma, experimental models and other evidence from human participants have shown that elevated intraocular pressure (IOP) results in damage to the optic nerve in a pattern characteristic of glaucoma. Furthermore, studies have demonstrated correlations between the level of IOP and the risk of having glaucoma as well as the worsening of glaucoma once present. Other studies have demonstrated that lowering IOP reduces both the incidence of glaucoma in individuals who do not have glaucoma damage but are at high risk for its development, and the rate of progression of glaucoma in individuals with established glaucoma. Therefore, the treatments for glaucoma today all focus on the reduction of IOP, which secondarily prevents the worsening of visual field loss and may therefore prevent visual impairment and blindness.

Treatments for Open-Angle Glaucoma

Medical, laser, and incisional surgical treatments are all used to treat glaucoma. The most commonly used medical treatment includes several classes of eye drops, such as prostaglandin analogs, beta-adrenergic antagonists, carbonic anhydrase inhibitors, and alpha-adrenergic agonists, as well as systemic carbonic anhydrase inhibitors. Laser trabeculoplasty is an office procedure that lowers IOP by increasing the outflow of aqueous humor from the eye. Incisional surgery to lower IOP includes procedures that have been performed for decades, such as trabeculectomy and aqueous drainage device surgery, as well as a host of newer procedures, such as non-penetrating deep sclerectomy, canaloplasty, endoscopic cyclophotocoagulation, and alternative methods of trabecular bypass.
Rationale for a Comparative Effectiveness Review

Although there is high-level evidence from randomized controlled trials (RCTs) of medical and laser therapy versus observation in patients with early glaucoma, initial medical therapy compared to initial surgical therapy in patients with established glaucoma, and laser therapy versus surgical therapy in participants not controlled with medical therapy, are addressed only by single RCTs that also do not, in most cases, include novel medical and surgical treatments.\textsuperscript{5,16,17}

Given developments in the treatment of glaucoma, including the realization of the importance of adherence to medical therapy, and the introduction of new surgical modalities, it is appropriate to update the evidence on the safety and effectiveness of glaucoma treatments.

Purpose of Evidence Report

The objective of this comparative effectiveness review is to summarize the evidence regarding the safety and effectiveness of medical, laser, and other surgical treatments for open-angle glaucoma (OAG) in adults.

Key Questions

Key Question 1. Do medical, laser, and other surgical treatments for OAG reduce visual impairment?
- Key Question 1a: What is the comparative effectiveness of medical treatments for reducing visual impairment?
- Key Question 1b: What is the comparative effectiveness of laser and other surgical treatments for reducing visual impairment?
- Key Question 1c: What is the comparative effectiveness of medical versus surgical treatment for reducing visual impairment?

Key Question 2. Does treatment of OAG improve patient-reported outcomes?

Key Question 3. Do medical, laser, and other surgical treatments for OAG lower intraocular pressure?
- Key Question 3a: What is the comparative effectiveness of medical treatments for lowering intraocular pressure?
- Key Question 3b: What is the comparative effectiveness of laser and other surgical treatments for lowering intraocular pressure?
- Key Question 3c: What is the comparative effectiveness of medical versus surgical treatment for lowering intraocular pressure?

Key Question 4. Do medical, laser, and other surgical treatments for OAG prevent or slow the progression of optic nerve damage and visual field loss?
- Key Question 4a: What is the comparative effectiveness of medical treatments for preventing or slowing the progression of optic nerve damage and visual field loss?
- Key Question 4b: What is the comparative effectiveness of laser and other surgical treatments for preventing or slowing the progression of optic nerve damage and visual field loss?
- Key Question 4c: What is the comparative effectiveness of medical versus surgical treatment for preventing or slowing the progression of optic nerve damage and visual field loss?
Key Question 5. Does lowering intraocular pressure or preventing or slowing the progression of optic nerve damage and visual field loss reduce visual impairment and change vision-related quality of life?

Key Question 6. What are the harms associated with medical, laser, and other surgical treatments for OAG?

- Key Question 6a: What are the harms associated with medical treatments for OAG?
- Key Question 6b: What are the harms associated with laser and other surgical treatments for OAG?
- Key Question 6c: What harms are reported in studies of medical versus surgical treatments for OAG?
Methods

Topic Development

The Agency for Healthcare Quality and Research (AHRQ) requested that the Johns Hopkins University Evidence-based Practice Center (JHU EPC) assist with the formulation and refinement of the Comparative Effectiveness Review topic “Effectiveness of screening and treatment for glaucoma.”

In consultation with AHRQ, the JHU EPC identified a small group of stakeholders to serve as members of a Key Informant Group. The Key Informant Group helped shape the Key Questions (KQs) relevant to the topic by providing input regarding the populations and clinical subgroups, interventions, and outcomes of interest to clinicians, policy makers, payers, and consumers.

The JHU EPC investigators incorporated the feedback of the Key Informants into a draft of the KQs, analytic framework, and inclusion criteria which was posted to the AHRQ Web site for public comment from April 22 to May 20, 2010. KQs and Inclusion criteria were finalized after consideration of the public comments received.

A Technical Expert Panel was selected to provide broad expertise and perspectives specific to the topic under development. The Technical Expert Panel reviewed a protocol outlining a proposed methodological approach for the completion of the comparative effectiveness review, provided information to the JHU EPC to aid in the refinement of the inclusion criteria and literature search strategies and recommended approaches to specific issues as requested by the JHU EPC. The final protocol entitled Comparative Effectiveness of Treatment for Open-Angle Glaucoma was posted to the AHRQ Web site on November 16, 2010.

Analytic Framework

The analytic framework (Figure 1) is a modified version of a larger framework depicting the impact of both screening and treatment for open-angle glaucoma (OAG). The figure focuses on the treatment portion of the framework and depicts the KQs within the context of the inclusion criteria. In general, the figure illustrates how treatment of open-angle glaucoma may reduce visual impairment (KQ 1) and/or improve patient-reported outcomes (KQ 2). It shows how treatment of open-angle glaucoma may reduce intraocular pressure (KQ 3) and/or prevent or slow the progression of optic nerve damage and visual field loss (KQ4). The framework also depicts a potential relationship between the intermediate outcomes of visual field loss and optic nerve damage and the final health outcomes of visual disability and quality of life (KQ 5). Finally, the potential harms of treatment (KQ 6) are included in the framework.
Figure 1. Analytic framework for treatment of open-angle glaucoma

KQ = Key Question; T = Key questions for the Comparative Effectiveness of Treatment for Glaucoma; S = Key questions for the Comparative Effectiveness of Screening for Glaucoma

**Study Selection**

**Types of Studies**

We included randomized controlled trials (RCTs) and “quasi-randomized” controlled trials of medical, laser, and incisional surgical treatments for OAG for inclusion as primary studies for KQs 1, 2, 3, and 4. We included observational study designs, cohort and case control studies, in addition to randomized and “quasi-randomized” controlled trials for KQs 5 and 6.

We also included systematic reviews that address the KQs as described in Data Synthesis.

**Types of Participants**

We included studies of participants with primary or secondary chronic OAG or OAG suspects aged 40 years and older (specific exclusions are listed below). These types of glaucoma may also be described in the literature as the following conditions:

- Ocular hypertension
- Low tension or normal tension glaucoma
- Pseudoexfoliative glaucoma/pseudoexfoliation syndrome
- Pigmentary glaucoma
- Steroid-responsive glaucoma

We specifically excluded the following conditions: juvenile/congenital glaucoma, traumatic glaucoma, neovascular glaucoma, refractory glaucoma, and inflammatory glaucoma as well as all types of angle closure.

We considered studies that enrolled participants diagnosed with included and excluded glaucoma types (as described above) if the investigators conducted analyses of included subgroups and if we were able to abstract data for the included glaucoma types only.
We included studies in which at least 95 percent of the participants are aged 40 and older or those in which the mean age is greater than 50 years. If the age was not specified, the study was excluded.

There were no limitations based on stage or severity of disease, disease etiology, comorbid ocular or other medical conditions, geographic location, or demographic characteristics, (e.g., gender, race/ethnicity).

**Types of Interventions**

We included studies of medical (eye drops and systemic treatment), laser, and incisional surgery treatments for OAG.

**Medical Treatments**

We considered studies of the following agents for this review:

- Prostaglandin analogs
  - Bimatoprost
  - Latanoprost
  - Travoprost
- Beta adrenergic antagonists
  - Timolol
  - Levobunolol
  - Betaxolol
  - Carteolol
- Topical and oral carbonic anhydrase inhibitors
  - Acetazolamide
  - Brinzolamide
  - Dorzolamide
- Alpha2 adrenergic agonists
  - Brimonididine
- Combination medical treatments
  - Dorzolamide plus timolol
  - Brimonidone plus timolol

We included preparations of the above-mentioned agents by trade, or generic/chemical name. The complete list is in Appendix E.

We included studies of the impact of medical intervention on diurnal intraocular pressure if outcomes were assessed over a 24-hour period and participants were admitted to a hospital, sleep laboratory, or other facility overnight.

We excluded from this review studies of the following medical interventions that are no longer commonly used to treat glaucoma:

- Pilocarpine
- Apraclonidine
- Epinephrine
- Unoprostone
- Dipivaphrin
- Ocusert
- Iopidine
• Metipranolol
• Systemic β-blockers

We also excluded treatments that were not approved by the Food and Drug Administration (i.e., experimental treatments).

**Laser and Incisional Surgical Treatments**

We considered for this review studies of the following laser and incisional surgical treatments as well as use of devices that are designed to increase aqueous outflow.

**Office-Based Laser Treatments**

• Argon and selective laser trabeculoplasty (SLT)

**Surgical Procedures**

• Trabeculectomy
• Aqueous drainage devices
  o Baerveldt implant
  o Ahmed implant
  o Krupin implant
  o Molteno implant
• Cyclophotocoagulation – trans-scleral and endoscopic
• Deep sclerectomy
• Viscocanalostomy

**Specialized Surgical Devices**

• iScience microcatheter (canaloplasty)
• Trabectome (modified trabeculotomy)
• ExPRESS shunt (modified trabeculectomy)
• Glaukos iStent (trabecular bypass)
• SOLX™ gold shunt (trabecular bypass)

**Definitions of Surgical Treatments**

**Laser trabeculoplasty:** Laser energy (argon, YAG, diode) is applied to the trabecular meshwork in an effort to reduce the resistance to outflow for aqueous humor. The procedure is performed as part of an office visit and requires topical anesthesia and a mirrored contact lens.

**Trabeculectomy:** The most commonly performed incisional surgery for lowering intraocular pressure in glaucoma patients. Under local anesthesia, a passageway is created at the limbus (junction between the cornea and sclera) that allows the aqueous humor to flow from the anterior chamber to the space between the sclera and the conjunctiva, thereby lowering the intraocular pressure. The hallmark of a trabeculectomy is the fluid-filled bleb (blister) present on the surface of the eye underneath the upper eyelid.

**Trabeculotomy:** An incisional surgery procedure generally used to lower intraocular pressure in glaucoma affecting infants and children. A metal probe or a suture is passed into Schlemm’s canal, a structure into which aqueous humor passes as it exits the eye. The probe is used to disrupt tissue that is typically impeding outflow of aqueous from the eye, thereby
increasing outflow and decreasing the intraocular pressure. Some surgeons also use trabeculotomy in the treatment of glaucoma in adults.

**Aqueous drainage devices:** Any of a number of plastic implants used in the surgical management of glaucoma, with the aim of lowering the intraocular pressure. All devices consist of a tube that is inserted into the eye, and a plate connected to the tube that is sewn to the sclera and covered by conjunctiva. Aqueous humor moves through the tube and out of the eye to drain on top of the plate into the space between the plate and the conjunctiva.

**Cyclophotocoagulation:** A procedure in which laser energy is used to damage the ciliary processes, reducing the amount of aqueous humor that they produce, and thereby lowering the intraocular pressure. The procedure can be performed through the sclera (external cyclophotocoagulation) or from the inside of the eye (endocyclophotocoagulation).

**Deep sclerectomy:** In this procedure the surgeon makes an opening in the conjunctiva to expose the sclera. The surgeon dissects a partial thickness flap of about 5 mm in width to about one third depth in the sclera at the limbus. A second flap is dissected below this flap in order to leave a very thin layer of tissue and to expose Schlemm's canal. This underlying flap of scleral tissue is removed and the surgeon grasps the roof of Schlemm's canal and removes a strip that is about 3 mm in length. Aqueous humor is able to permeate the remaining tissue without a full thickness hole being necessary. The external flap is then sutured down in its original position and the conjunctiva is sewn back in place.

**Viscocanalostomy:** The surgical procedure is the same as for deep sclerectomy (see above). In addition, viscoelastic is injected into Schlemm's canal in a circumferential fashion in an effort to dilate Schlemm's canal. The external flap is then sutured down in its original position and the conjunctiva is sewn back in place.

**Canaloplasty:** First a combined deep sclerectomy and viscocanalostomy procedure is performed (see above). Following this a microcathater with an illuminated tip is passed through Schlemm's canal for 360 degrees. A 10-0 Prolene suture is tied to the catheter and threaded around Schlemm's canal for 360 degrees. The two ends of this suture are tied under tension in an effort to expand Schlemm's canal. The external flap is then sutured down in its original position and the conjunctiva is put back in place.

**Trabectome:** The surgeon makes a 1.7 mm incision through the peripheral cornea and injects viscoelastic into the anterior chamber. The Trabectome device is then introduced into the anterior chamber and under visualization using direct gonioscopy with an operating microscope the Trabectome is used to ablate about one quadrant of trabecular tissue. The Trabectome uses low energy electrical pulses to vaporize the trabecular tissue and aspiration is used to remove it. The viscoelastic is removed and the corneal wound is sutured closed.

**iStent:** The Glaukos Trabecular Micro-Bypass Stent (iStent) is placed into Schlemm’s canal. It is made of nonferromagnetic titanium. One end sits in the anterior chamber and the posterior end sits in Schlemm’s canal allowing fluid to bypass the trabecular meshwork. The device is inserted under direct visualization (using direct gonioscopy) through a 3 mm temporal clear corneal incision. After placing viscoelastic in the anterior chamber, the applicator is passed through the incision and the device is anchored into Schlemm’s canal in the nasal angle. Viscoelastic is removed with irrigation and aspiration.

**Gold shunt:** The SOLXTM Gold Shunt is a 24-karat gold rectangle (3.2 x 5.2 mm) that connects the anterior chamber to the suprachoroidal space. There are two plates with grooves in them to allow flow from the higher-pressure anterior chamber to the lower pressure suprachoroidal space. The conjunctiva is disinserted at the limbus and a full thickness scleral
incision is created 2 mm posterior to the limbus. A crescent blade is used at 90% scleral depth to
direct the anterior portion of the shunt to the anterior chamber and to cut posteriorly 2 to 3 mm to
direct the posterior segment into the suprachoroidal space. The scleral incision is closed with 10-
0 nylon sutures, and the conjunctiva is closed.

Surgical Treatment of Coexisting Cataract and Glaucoma

We included studies of combined cataract and glaucoma surgical procedures published after
April 2000. Studies published prior to this period are summarized in the AHRQ report titled
Surgical Treatment of Coexisting Cataract and Glaucoma.\(^7\) We excluded from this review studies
of the following surgical interventions or surgery-related conditions or complications:

- Cataract surgery alone among participants with glaucoma
- Treatment of surgical complications
- Intraocular pressure variations after surgery and treatment of IOP after surgery
- Intraocular pressure fluctuation after surgery
- Variations in anesthesia
- Assessment or treatment of filtering blebs alone (bleb survival, revision of blebs,
  comparisons of blebs, bleb failure)

Comparators

KQs 1, 2, 3, 4, and 6 explored comparisons of medical, laser, and incisional surgical
treatments for OAG to each other (e.g., medical versus laser, medical versus medical) or to no
treatment. For KQs 1, 2, 3, 4, and 6, we also included studies in which the intervention is a laser
or incisional surgical treatment for glaucoma but the comparator is a combined or staged
procedure for cataract and glaucoma (glaucoma surgical treatments combined or staged with
phacoemulsification or extra capsular cataract extraction).

Outcomes

Key Question 1

Primary Outcome

The proportion of participants with moderate, severe, and profound visual impairment as
defined in the International Classification of Diseases, Clinical Modification, 9th Revision (ICD-
9).\(^8\) The ICD-9 criteria define moderate visual impairment as best corrected visual acuity of
between 20/70 and 20/160, severe visual impairment as acuity between 20/200 and 20/400 or a
visual field of 20 degrees or less, and profound visual impairment as an acuity of 20/500 to
20/1000 or no more than 10 degrees of visual field. We also considered other measurements of
visual impairment as defined by included studies.

Secondary Outcome

We included visual acuity outcomes among the treatment groups of interest (Early Treatment
of Diabetic Retinopathy Study or Snellen) as reported in included studies (e.g., mean visual
acuity or proportion of participants in pre-specified visual acuity categories).
Key Question 2
We considered participants’ mean total or relevant item/subscale scores as measured by any validated questionnaire, e.g., National Eye Institute Visual Function Questionnaire (NEI-VFQ), for the following patient-reported outcomes among the treatment groups of interest:

Primary Outcome
Vision-related quality of life (vision-related functional loss as well as the impact of functional loss on activities of daily living)

Secondary Outcomes
- Treatment convenience
- Patient satisfaction
- Patient preference values or utility values
- Adherence to medical treatment

Key Question 3

Primary Outcome
We included the proportion of participants with intraocular pressure measurements at pre-specified levels as outlined below among the treatment groups of interest. Since the analysis of intraocular pressure varies appreciably by trial, we considered other intraocular pressure outcomes as reported in included studies.
- Intraocular pressure ≤ 18 mmHg
- ≥ 20% decrease in intraocular pressure from baseline levels

Key Question 4

Primary Outcomes
- The proportion of participants with progressive optic nerve damage as defined by included studies and as observed via fundus photography or other imaging of the posterior pole.
- The proportion of participants with progression of visual field loss as defined by the Early Manifest Glaucoma Trial and as measured via automated threshold perimetry. We also considered other assessments of visual field loss as defined by included studies.

Key Question 5
Key Question 5 explores the association of (1) lowering intraocular pressure or (2) preventing or slowing the progression of (a) optic nerve damage and (b) visual field loss (intermediate outcomes of treatment) and final health outcomes (reduced visual impairment and improved vision-related quality of life) among the populations of interest. The outcomes were as described above in Outcomes for Key Questions 1, 2, 3, and 4.

Key Question 6
We compared the proportion of participants experiencing the following adverse events among the treatment groups of interest:
Potentially serious:
• Cataract formation (visually significant cataract requiring surgery or report of cataract surgery)
• Low intraocular pressure (hypotony)
• Decreased visual acuity
• Infection (e.g., blebitis, endophthalmitis)
• Inflammation
• Strabismus
• Peripheral anterior synechiae
• Retinal tear and detachment
• Systemic allergic reaction
• Loss of an eye
• Need for additional surgery
• Hyphema
• Transient decrease in central vision
• Systemic side effects
• Choroidal (detachment, effusion, hemorrhage)
• Cardiac arrhythmia
• Death

Less likely to be serious:
• Eye irritation
• Eye watering
• Eye redness
• Patient discomfort
• Ocular surface disease
• Other patient complaint
• Skin discoloration
• Conjunctival injection
• Iris color change
• Punctal stenosis
• Conjunctival foreshortening

We also included other harms as reported in included studies.

Timing of Outcomes

Medical Treatments
We assessed medical treatment outcomes at a minimum of one month post intervention. We included outcomes reported at 6 months (2–9 months) and one year (10–18 months) as reported in included studies. The exception was circadian medical treatment studies in which the investigators report outcomes assessed over a twenty-four hour period.
Surgical Treatments

We assessed outcomes at a minimum of one year (10–18 months) and at annual intervals thereafter as reported in included studies.

Setting

Eye care provider clinical settings only (ophthalmologists and optometrists)

Search Strategy

We searched the following databases for primary studies: MEDLINE, Embase, LILACS (Latin American and Caribbean Literature on Health Sciences) and CENTRAL (the Cochrane Central Register of Controlled Trials). We developed a search strategy for MEDLINE, accessed via PubMed, based on an analysis of the medical subject heading (MeSH) terms and text words of key articles identified a priori and adapted this search strategy for searches of Embase (using EMTREE terms) and CENTRAL (Appendix A). We searched the literature without imposed language, sample size or date restrictions, but excluded non-English language studies at the time of full text review. We searched relevant systematic reviews to identify any additional eligible articles. The databases were last searched on October 6, 2011.

We also conducted a search in MEDLINE and CENTRAL for systematic reviews that address the KQs of interest. For MEDLINE, the search included the topic strategy, as noted above, combined with the term “AND systematic[sb]” and was limited to systematic reviews published from 2009 to 2011. The search for systematic reviews was conducted on March 2, 2011. We screened an existing database of eye and vision systematic reviews to identify relevant OAG systematic reviews published prior to 2009.6

Abstract Screening

We screened potentially relevant citations (primary studies and systematic reviews) using the Web-based systematic review software, DistillerSR (http://systematic-review.net/). Citations identified by the search strategies were uploaded to DistillerSR and managed in the following manner: Two reviewers independently assessed titles and abstracts resulting from the literature searches according to the inclusion criteria. We classified the titles and abstracts as “include,” “exclude” or “unsure.” Disagreements about eligibility were resolved through discussion among reviewers. A copy of the abstract review form is included in Appendix B.

Full-Text Screening

Citations tagged as “unsure” by both reviewers, “unsure” by one reviewer and “include” by the other, or “include” by both reviewers, were promoted to full-text screening. Two reviewers independently applied the same inclusion criteria as used during abstract screening. Non-English language articles were also removed from further consideration at this stage. We resolved any disagreements regarding inclusion through discussion or, as needed, during a team meeting.

Data Abstraction

Data abstraction forms were designed and pilot tested. One reviewer extracted descriptions of the study, including details about the population, intervention(s) and outcomes of interest, using
the systematic review software, DistillerSR. A second reviewer verified the data. We resolved disagreements through discussion.

**Risk-of-Bias Assessment**

We used the Cochrane Collaboration’s tool for assessing the risk of bias of randomized and quasi RCTs. Two reviewers assessed the included studies for sources of systematic bias according to the guidelines in Chapter 8 of the Cochrane Handbook for Systematic Reviews of Interventions using the following criteria: sequence generation and allocation concealment (selection bias), masking of participants, study investigators, and outcome assessors (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias), and other sources of bias. Masking of investigators and participants might not have be possible with some of the interventions being examined, but was noted when mentioned. We reported judgments for each criterion as “Low risk of bias,” “High risk of bias” or “Unclear risk of bias (information is insufficient to assess).” The two reviewers resolved disagreements through discussion.

Two reviewers assessed the methodological rigor of observational studies using a modified version of the Newcastle Ottawa Scale. The Newcastle Ottawa Scale includes domains to assess the quality of study group selection (representativeness, selection, case definitions), comparability of cohorts/cases, and controls. On the basis of the design or analysis, and ascertainment of exposure(s) or outcome(s) adequacy of follow-up, non-response rate and financial or other conflicts of interest. Each item query required a yes, no, or unable to determine/not reported response. In addition, reviewers provided an overall assessment of the quality of each study as “good” “fair” or “poor” using the reporting bias, selection bias, and confounding domains as a basis for the assessment.

We used a tool adapted by Li (2010) from the Critical Appraisal Skills Program, Assessment of Multiple Systematic Reviews; and the Preferred Reporting Items for Systematic Reviews and Meta-analyses statement, to assess the methodological quality of systematic reviews. We used the following criteria, adapted from Li, to determine which systematic reviews were of sufficient quality to be considered for inclusion in this review: comprehensive search for primary studies (searches of more than one bibliographic database); risk of bias assessment; and appropriate analysis methods (no pooled arm analysis).

**Rating Body of Evidence**

We assessed the quantity, quality and consistency of the body of available primary study evidence addressing KQs 1 through 6. We used an evidence grading scheme recommended by the GRADE Working Group, adapted by AHRQ in the Methods Guide for Effectiveness and Comparative Effectiveness Reviews (http://www.effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=328) and recently published in the Journal of Clinical Epidemiology.

Although we included systematic reviews that addressed our KQs and consider systematic reviews as the highest level of evidence for addressing questions of therapy, we were unable to adapt the grading scheme to include systematic reviews as the evidence grading scheme is designed to assess the body of evidence derived from individual studies and is less amenable assessment of the evidence from one or more systematic reviews incorporated into a more complex review.
We assessed the quality and consistency of the best available primary study evidence, including assessment of the risk of bias in relevant studies, as well as aspects of consistency, directness, and precision as described in the Methods Guide for Effectiveness and Comparative Effectiveness Reviews and by Owens (2010).\textsuperscript{12, 13} For each outcome of interest, two reviewers graded the major outcomes for each of the KQs and, if needed, discussed their recommendations and reached consensus.

**Data Synthesis**

When we identified existing high-quality systematic reviews that addressed the KQs, we cited these reviews as evidence and did not abstract and synthesize data from primary studies. We abstracted and synthesized data from primary studies that addressed interventions, comparisons, and outcomes that were not identified in systematic reviews, and those studies that had been published or identified after the date of last search conducted for the systematic review. We adapted the recommendations of Whitlock (2008) for incorporating systematic reviews in complex reviews and provided a narrative summary of the review methods (i.e., inclusion/exclusion criteria, search strategy, statistical methodology) and findings (i.e., number of studies included, quantitative and qualitative results). Similarly, in the instance of multiple reviews, we evaluated the consistency across reviews addressing the same key question.\textsuperscript{14}

The plan for the analysis of primary studies, including the assessments of heterogeneity, reporting bias, measures of treatment effect, data synthesis, and subgroup analysis was included in the protocol for this review.
Results

We identified 73 RCTs, 13 observational studies and 23 systematic reviews. The flow search for the literature search for the systematic reviews is described in Figure 2 and the flow search for the literature search for primary studies is described in Figure 3. Details of all studies and systematic reviews are included in Evidence Tables in Appendix C. A listing of included articles, with reason(s) for exclusion is provided in Appendix D.

Figure 2. Systematic review literature search for treatment of open-angle glaucoma

*Total may exceed number in corresponding box, as articles excluded by two reviewers at this level.
Figure 3. Primary study literature search for treatment of open-angle glaucoma

Search Results from Electronic Databases
10770
MEDLINE 6191
Cochrane 463
EMBASE 3480
LILACS 276

Duplicates: 556
Conference abstracts: 532

Title/Abstract Review
9580

Excluded
7381

Article Review
2299

Excluded
1933

Included in prior systematic reviews**
280

Included articles***
96
KQ1a-11
KQ1b-4
KQ2-9
KQ3b-17
KQ4a-19
KQ4c-1
KQ5-2
KQ6a-29
KQ6b-26

Surgical (52)
- Burr 2004: 2
- Chai 2010: 8
- Cheng 2009: 11
- Gdh 2011: 2
- Kirmawan 2009: 3
- Naier 2005: 7
- Rolim de Moura 2009: 8
- Stewart 2010: 6
- Vass 2007: 6
- Wilkins 2010: 2

Reasons for Exclusion at Title/Abstract Review Level
- No original data: 1281
- No subjects with open-angle glaucoma: 1794
- Juvenile glaucoma only: 188
- Does not include treatment for open-angle glaucoma: 956
- Does not address any key questions: 3115
- Case series with less than 100 patients/100 eyes: 1914
- No human data: 119
- Foreign language: 513
- Other reasons**: 162

Reasons for Exclusion at Article Review Level
- No original data: 201
- No subjects with open-angle glaucoma: 48
- Does not include treatment for open-angle glaucoma: 137
- Does not address any key questions: 285
- Short-term follow-up only (less than 1 month for medical/1 year for surgical): 220
- Not an RCT and has less than 100 patients: 399
- Combined cataract/glaucoma surgery published before April 2000: 67
- Animal or in vitro data: 26
- No abstractable data: 254
- Unable to analyze OAG separately: 171
- Case series: 353
- Non-FDA approved/outdated drug: 39
- Has unique medical comparators: 69
- Other reasons***: 377
- Other reasons**: 364

*Total may exceed number in corresponding box, as articles were excluded by two reviewers at this level.
**Total may exceed number in corresponding box, as some articles were covered by more than one systematic review.
***Total may exceed number in corresponding box, as articles may apply to more than one key question
****Other reasons: e.g. comparisons of case series, patient education reports, type of study does not correspond to the KQ, laboratory or autopsy data, letter or commentaries, drugs out of the list.
A summary of the number of articles included by Key Question (KQ), type of study, and type of intervention is presented in Table 1.

<table>
<thead>
<tr>
<th>Question and Comparison</th>
<th>Systematic Reviews</th>
<th>Randomized Controlled Trials</th>
<th>Observational Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical Treatments</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KQ 1a</td>
<td>0</td>
<td>11</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 3a</td>
<td>9</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 3 – circadian</td>
<td>3</td>
<td>5</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 4a</td>
<td>1</td>
<td>19</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 6a</td>
<td>11</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td><strong>Surgical Treatments</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KQ 1b</td>
<td>2</td>
<td>4</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 3b</td>
<td>9</td>
<td>20</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 4b</td>
<td>0</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 6b</td>
<td>8</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td><strong>Medical-Surgical Treatments</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>KQ 1c</td>
<td>1</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 3c</td>
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<td>NA</td>
</tr>
<tr>
<td>KQ 4c</td>
<td>3</td>
<td>1</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 6c</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
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<td><strong>Additional Questions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KQ 2</td>
<td>2</td>
<td>9</td>
<td>NA</td>
</tr>
<tr>
<td>KQ 5</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

KQ = Key Question; NA = not applicable

Narrative summaries of the evidence identified for KQs 1, 3, 4, and 6 are presented within each of the following treatment comparison groups: Medical treatment, surgical treatment, and medical versus surgical treatment. KQs 2 and 5 are discussed under subheadings identified by KQ. For each question and comparison, evidence from systematic reviews is discussed first, followed by evidence from primary studies.

**Medical Treatment of Open-Angle Glaucoma**

**Systematic Reviews of Medical Interventions for Open-Angle Glaucoma**

We included 12 systematic reviews that address the comparative effectiveness of medical interventions for open-angle glaucoma (OAG) (Appendix C). The most common comparisons included head-to-head comparisons of prostaglandin analogs, prostaglandin analogs compared to timolol, latanoprost compared to brimonidine, timolol compared to brimonidine, and concomitant compared to fixed combination medications. Vass (2007) provided an overview of various topical medical treatments compared to placebo, no treatment, or another medical treatment. While all systematic reviews included participants with OAG, some reviews also included studies that enrolled participants with mixed or “other” glaucoma (approximately 2% of participants), and chronic-angle closure glaucoma (included in population in a minimum of one trial in a single systematic review).
KQ 1a: What is the comparative effectiveness of medical treatments for reducing visual impairment?

**Key Points**
- No studies of medical therapy were identified that directly addressed outcomes related to visual impairment.
- The available studies addressing secondary outcomes of change in visual acuity and visual field loss are of too short a duration to answer this question given that glaucoma is typically a slowly progressive disease that may take many years to cause clinically or statistically significant changes.

**Evidence From Systematic Reviews**
We did not identify any systematic reviews of medical interventions for OAG that included outcomes related to visual impairment.

**Detailed Analysis of Primary Studies**
We identified eleven studies comparing medical therapies for glaucoma that also reported something about vision-related outcomes. Unfortunately, none of these reported any outcomes related to actual impairment but rather were limited to the secondary outcomes of visual acuity and visual field mean defect. Of the 11 studies, eight reported on the visual field and six on visual acuity.

Two studies demonstrated some improvement in visual field performance. The study by Prata (2009) comparing timolol, brimonidine, and travoprost, showed an overall decrease in mean deviation (-6.56 to -5.72, p=0.045) in treated subjects. A study comparing betaxolol to levobunolol by Marcon (1990) demonstrated some improvement in visual field performance in 1 of 20 subjects.

Two additional studies reported no change in visual field over the course of the studies. A cross-over study of dorzolamide-timolol, travoprost, and latanoprost showed no significant change in visual field mean deviation or pattern standard deviation over 9 months of treatment, and a study of timolol and carteolol showed no change in the visual field over 16 weeks. The 9-month study used non-standard definitions of progression (2dB loss in mean deviation or one point with a decrease in threshold of 10dB) that would not be expected to be seen over the short duration of the study.

Four studies produced results suggestive of a decline in visual field but none were able to demonstrate any statistical significance. A study of carteolol vs. timolol presented the distribution of changes in visual field mean defect, which suggests that there was a net decline in both groups. But again, no statistics were provided. Tuulonen (1989) compared laser trabeculoplasty to topical medications and demonstrated visual field decline in both groups (-7.4 to -8.6 with laser, -9.1 to -9.4 with medications), though neither decline was statistically significant.

Reports of visual acuity outcomes were similarly variable. The study comparing betaxolol to levobunolol by Marcon (1990) included two subjects (10%) with improved visual acuity. The comparison of dorzolamide-timolol, travoprost, and latanoprost by Chiselita (2005) showed no change in visual acuity over 9 months of treatment. Yamamoto (1996) found no subjects lost two or more lines of vision over 16 weeks in their trial of timolol and carteolol.
(1994) compared levobunolol to no treatment in ocular hypertensives and reported “no variation” in visual acuity, though no criteria were provided.\textsuperscript{36} Two studies reported worsening of visual acuity at some point during the study but neither outcome was believed to be due to treatment. Berson (1985) compared levobunolol to timolol and found that 57 subjects had a decline of two or more lines of visual acuity at some point, but that these were transient.\textsuperscript{37} Similarly, Schuman (1997) found a decrease of two or more lines of acuity in 5.9 percent of their brimonidine treated group and 9.5 percent of their timolol treated group, at 12 months.\textsuperscript{38} We present a summary of the studies included in the review of KQ 1a with comparators, outcomes and results (Table 2, summary table for KQ 1a).

**Table 2. Summary table for KQ 1a**

<table>
<thead>
<tr>
<th>Study</th>
<th>Patients/eyes</th>
<th>Comparators</th>
<th>Outcome</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berry 1984\textsuperscript{41}</td>
<td>20 pat/35 eyes 26 pat/43 eyes</td>
<td>Betaxolol 0.5% Timolol 0.5%</td>
<td>Visual acuity</td>
<td>Data not reported</td>
</tr>
<tr>
<td>Berson 1985\textsuperscript{37}</td>
<td>48 pat 51 pat 42 pat</td>
<td>Levobunolol 0.5% Levobunolol 1% Timolol 0.5%</td>
<td>Visual acuity</td>
<td>Transitory changes, considered unrelated to treatment</td>
</tr>
<tr>
<td>Chiselita 2005\textsuperscript{32}</td>
<td>38 pat/38 eyes</td>
<td>Latanoprost Travoprost Dorzolamide/Timolol</td>
<td>Visual acuity</td>
<td>No significant change over 9 months</td>
</tr>
<tr>
<td>Flammer 1992\textsuperscript{34}</td>
<td>35 pat 37 pat</td>
<td>Carteolol Timolol 0.5%</td>
<td>Visual acuity and visual fields</td>
<td>Suggested decline in visual fields defect in both arms</td>
</tr>
<tr>
<td>Liu 2002\textsuperscript{40}</td>
<td>27 pat 27 pat</td>
<td>Latanoprost 0.005% Brimonidine 0.15%</td>
<td>Visual acuity</td>
<td>Data not reported</td>
</tr>
<tr>
<td>Marco 1990\textsuperscript{31}</td>
<td>20 pat</td>
<td>Betaxolol 0.5% Levobunolol</td>
<td>Visual acuity and visual fields</td>
<td>No significant improvement in visual fields</td>
</tr>
<tr>
<td>Prata 2009\textsuperscript{30}</td>
<td>17 pat 14 pat 19 pat</td>
<td>Timolol 0.5% Brimonidine Travoprost</td>
<td>Visual acuity and visual fields</td>
<td>No correlation between IOP reduction and changes in visual function between the 3 medications</td>
</tr>
<tr>
<td>Ravalico 1994\textsuperscript{36}</td>
<td>12 pat/23 eyes 14 pat/26 eyes</td>
<td>Levobunolol 0.5% Untreated</td>
<td>Visual acuity</td>
<td>Data not reported</td>
</tr>
<tr>
<td>Sharpe 2004\textsuperscript{39}</td>
<td>33 pat 33 pat</td>
<td>Brimonidine Dorzolamide</td>
<td>Visual acuity</td>
<td>Data not reported</td>
</tr>
<tr>
<td>Schuman 1997\textsuperscript{38}</td>
<td>186 pat 188 pat</td>
<td>Brimonidine Timolol 0.5%</td>
<td>Visual acuity</td>
<td>Changes, considered unrelated to treatment</td>
</tr>
<tr>
<td>Yamamoto 1996\textsuperscript{33}</td>
<td>12 pat 9 pat 12 pat</td>
<td>Timolol 0.5% Carteolol 1% Carteolol 2%</td>
<td>Visual acuity</td>
<td>No significant change over 16 weeks</td>
</tr>
</tbody>
</table>

The grading of evidence for KQ 1a with all the domains is summarized in Table 3.

**Table 3. Grading of evidence for KQ 1a**

<table>
<thead>
<tr>
<th>Number of Studies; Participants</th>
<th>Risk of Bias</th>
<th>Consistency</th>
<th>Directness</th>
<th>Precision</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Impairment/Visual Acuity</td>
<td>RCT/Medium</td>
<td>Inconsistent</td>
<td>Direct</td>
<td>Imprecise</td>
<td>Insufficient</td>
</tr>
<tr>
<td>11; 918</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

None of the studies identified were of sufficient duration or size to identify outcomes that could plausibly be related to visual impairment due to glaucoma, which is most often a slowly progressive disease. Given the relatively slow loss of vision, even in those not being treated for glaucoma, studies attempting to assess visual impairment would need to extend to perhaps 10 or more years to be able to assess differences in visual impairment. Suggesting studies of this length is supported by the relatively low rates of progression seen in the large trials of glaucoma therapy (Ocular Hypertension Treatment Study, Collaborative Initial Glaucoma Treatment Study, Advanced Glaucoma Intervention Study) but the actual duration would need to be determined based on the initial severity of disease and anticipated risk of progression in the study population.

KQ 3a: What is the comparative effectiveness of medical treatments for lowering intraocular pressure?

Evidence from systematic reviews and primary studies addressing diurnal intraocular pressure (IOP) measurements are discussed separately.

Key Points

- Prostaglandins lower IOP more than dorzolamide (carbonic anhydrase inhibitor, 2.64 mmHg, 3 trials), brimonidine (alpha-adrenergic agonist, 1.64 mmHg, 4 trials), and timolol (beta-adrenergic blocker, 5% greater at 6 months, 4 trials). (Systematic Review)
- The prostaglandins appear similar in the extent to which they lower IOP, but some studies have reported a greater drop in IOP with bimatoprost (prostaglandin).
- The combination dorzolamide/timolol appears to lower IOP the same amount as prostaglandins.

Summary of Evidence From Systematic Reviews

Prostaglandin Analogs Versus Timolol

Studies comparing Timolol with travoprost\textsuperscript{24} and latanoprost,\textsuperscript{25} showed prostaglandin analogs more effective at lowering IOP. The percent IOP reduction from baseline to 1 month was 4 percent greater for participants randomized to latanoprost compared to travoprost at 1 month (95% CI, 1.2 to 6.3, three trials) and 5 percent greater at 6 months (WMD 5.0; 95% CI, 2.8 to 7.3, four trials). The mean reduction in IOP after 3 or more months was 0.81 mmHg lower for participants receiving travoprost (95% CI, -1.16 to -0.45, four trials).

Prostaglandin Analogs (Head-to-Head Comparisons)

Two systematic reviews included comparisons of bimatoprost and latanoprost. In both reviews the investigators concluded that bimatoprost lowered IOP more effectively than latanoprost.\textsuperscript{19,20} The difference in the proportion of participants achieving an IOP less-than or equal-to 17 mm Hg was greater with bimatoprost at 3 months, (Risk difference [RD], 12; 95% confidence interval [CI], 4 to 21, two trials), but no difference was found at 1 and 6 months.\textsuperscript{19} Cheng (2008) also noted a significant mean percent reduction in morning IOP with bimatoprost versus latanoprost (2.6% at 1 month, 2.4% at 3 months, and 5.6% at 6 months)\textsuperscript{19} and Eyawo (2009) reported significant mean IOP reduction with bimatoprost at 3 or more months of follow-up (weighted mean difference [WMD], 0.73; 95% CI, 0.10 to 1.37, eight trials).\textsuperscript{20}
Both Eyawo (2009) and Li (2006) compared travoprost to latanoprost and to bimatoprost. Both reviews concluded that mean IOP reduction was similar when comparing travoprost to latanoprost. Li (2006) and Eyawo (2009) differed in their conclusions regarding bimatoprost versus travoprost, as Eyawo reported a significant difference in favor of bimatoprost at 3 or more months of followup (WMD, 0.88; 95% CI, 0.13 to 1.63, eight trials), while Li concluded that bimatoprost and travoprost were similarly effective (WMD 0.08; 95% CI, -0.62 to 0.79, five trials).

Concomitant Versus Fixed Combination Medical Treatments

Cheng (2009) reported no difference in the mean percent reduction in IOP at 10 a.m., when they compared latanoprost to dorzolamide/timolol combination treatment. Cox (2009) undertook a more general analysis of concomitant versus fixed combinations including travoprost, brimonidine, dorzolamide, bimatoprost, or latanoprost combined with a beta blocker. Overall concomitant administration resulted in a larger mean difference in IOP from baseline to 3 months, although the difference was significant only when IOP was measured at 2 hours (WMD, 0.39; 95% CI 0.04 to 0.75, six trials) and 8 hours (WMD, 0.50; 95% CI, 0.16 to 0.85, four trials) after a dose of medication.

Other Comparisons

Loon (2008) concluded that timolol and brimonidine were similarly effective after comparisons of the two medications in eight trials of varying follow-up periods, and after conducting subgroup analyses of trials of less than and more than 6 months of followup (three and five trials, respectively).

Fung (2007) and Hodge (2008) compared latanoprost and brimonidine. Fung (2007) concluded that use of latanoprost resulted in a greater mean reduction of IOP in a group of heterogeneous trials of varying duration (WMD 1.10 mmHg; 95% CI, 0.57 to 1.63, 14 trials). Subgroup analyses of trials of less than 6 months duration and those with 8 or more months of follow-up supported the trend of lower mean IOP among those using latanoprost, with a mean difference in IOP lowering of 1.64 mm Hg in trials of greater than or equal to 8 months (95% CI, 0.92 to 2.36, four trials). Hodge (2008) reported no difference in mean IOP at 3 months (WMD, -1.04; 95% CI, -3.01 to 0.93, three trials).

Hodge (2008) compared latanoprost and dorzolamide. Participants receiving latanoprost had lower IOP on average at 3 months (WMD, -2.64; 95% CI, -3.25 to -2.04, three trials).

Detailed Analysis of Primary Studies

The primary studies identified as part of our search were all subsumed by the available systematic reviews.

Grading of Evidence

The assessment of the quality of evidence reported by the included systematic reviews were determined to be adequate so the included studies were not re-evaluated using the additional criteria used for the primary studies included elsewhere in this report.

Conclusions

As single agents, prostaglandins are currently the most effective at lowering IOP. Some studies have found greater IOP lowering with bimatoprost, but this has not been a consistent
finding. The combination of dorzolamide and timolol appears to lower IOP about the same amount as prostaglandins.

**Effect of Medical Treatments on Circadian Intraocular Pressure**

There is some evidence from clinical trials that fluctuation of IOP throughout the day (diurnal variation) may be important in terms of predicting future progression. We therefore explicitly included studies that evaluated this aspect of glaucoma medications.

**Key Points**

- Our conclusions regarding the effect of topical therapies in lowering IOP over the 24-hour time period were limited due to the fact that one study provided almost all of the data.
- All topical medications reviewed appear to lower IOP throughout the 24-hour cycle.
- Prostaglandins appear to lower IOP more over the 24-hour cycle than beta-blockers, topical carbonic anhydrase inhibitors and alpha agonists, but the evidence for this is weak.
- While the IOP lowering effects of different prostaglandins appear to vary appreciably over the 24-hour time period, the results were inconsistent and the reported difference in the amount of IOP lowering was on the order of 1 mmHg.
- Results from systematic reviews comparing one prostaglandin to another were inconsistent.

**Summary of Evidence From Systematic Reviews**

Aptel (2008) performed a meta-analysis of mean IOP reduction for head-to-head comparisons of prostaglandin analogs based on IOP measurements taken at 8 a.m., 12 p.m., 4 p.m., and 8 p.m. IOP reduction was significantly greater with use of bimatoprost, when compared to latanoprost, at all time periods. Mean IOP reduction of bimatoprost was greater than travoprost at 8 a.m. and 12 p.m., but not different at the 4 p.m. and 8 p.m. time periods. In addition, travoprost had roughly the same effectiveness as latanoprost at lowering IOP across all time periods under investigation.

Cheng (2008) looked at the percent reduction in circadian IOP from baseline in three trials comparing bimatoprost and latanoprost and found that mean reduction was not different at follow-up (2.5% at 1 month and 2.1% at 3 months).

Cheng (2009) compared latanoprost to dorzolamide/timolol combination treatment (including studies of both fixed and concomitant administration of dorzolamide/timolol) and found no difference in diurnal mean percent reduction in IOP at any time point (1, 2, 3, and 6 months).

**Detailed Analysis of Primary Studies**

The medications used to lower IOP may not have equal effectiveness at different time points during the day. It is possible that some medications work better at night than others while others may work better during the daytime hours. The main way to assess this difference is to measure the IOP over the entire 24-hour period. Five RCTs met the inclusion criteria. IOP outcomes for the five RCTs were largely reported graphically and so we provide a narrative summary of the findings.

We present a summary of the studies included in the review of circadian studies with comparators, outcomes and results (Table 4).
Quaranta (2008) studied latanoprost versus bimatoprost in 40 newly diagnosed participants with glaucoma with IOP less than or equal to 21 mmHg when measured once every two hours from 8 a.m. until 8 p.m. The trial randomized participants to either bimatoprost or latanoprost for 8 weeks, followed by a 24-hour IOP assessment. Participants then crossed over to the other drug for another 8 weeks, followed by a 24-hour IOP assessment. There was no difference over the 24-hour period between the two treatments. IOP dropped between 1.5 and 3.5 mmHg at different time points with an average drop of 2 mmHg from a mean of 15.5 mmHg. Blood pressure (monitored over 24 hours) did not change when using either medication.

A separate study, by the same authors involved a cohort of 27 newly diagnosed glaucoma patients with IOP greater than or equal to 23 mmHg and less than or equal to 32 mmHg (computed by taking the average of the two highest IOP measurements between 8 a.m. and 6 p.m.) The study randomized the patients to timolol 0.5 percent, brimonidine 0.2 percent, dorzolamide 0.2 percent (all given twice a day) and latanoprost (given once a day) in a crossover design in which all four medications were used by each of the patients for 6 weeks followed by 4-week washout periods. Latanoprost lowered IOP about 1 mmHg more than the other medications over the 24-hour time period, and no differences were seen when comparing the other medications to themselves in other arms of the study. All drugs decreased IOP at all time points over 24 hours. Both brimonidine and timolol lowered IOP less during sleeping hours than latanoprost. Brimonidine and timolol lowered systolic blood pressure and diastolic blood pressure compared to baseline over 24 hours, and brimonidine lowered it the most, especially at night.

Larsson (2001) randomized 27 participants with IOP greater than 21 mmHg (who did not have glaucoma) to 4 weeks of either timolol 0.5 percent gel (once a day in the morning) or latanaprost (once a day in the evening) with a washout of 4 weeks before crossover. Latanoprost lowered IOP more than timolol gel at every time point by an average of about 1.5 mmHg with a slightly greater reduction observed during sleeping hours. The study saw no differences in systolic blood pressure, diastolic blood pressure or heart rate were noted over 24 hours.

<table>
<thead>
<tr>
<th>Study</th>
<th>Comparators</th>
<th>Patients</th>
<th>Treatment Specifics</th>
<th>Mean IOP Baseline (mmHg)</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larsson 2001</td>
<td>Latanoprost 0.005%</td>
<td>27 pts</td>
<td>Wash out 4w</td>
<td>23.8</td>
<td>Better effect on IOP with latanoprost than Timolol. No effect on blood pressure or heart rate</td>
</tr>
<tr>
<td></td>
<td>Timolol 0.5%</td>
<td>Cross over</td>
<td>Duration 4w</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orzalesi 2006</td>
<td>Latanoprost 0.005%</td>
<td>44 pts</td>
<td>Wash out 4w</td>
<td>21.9</td>
<td>IOP was reduced with the 3 drugs, more so with bimatoprost. No effect on blood pressure.</td>
</tr>
<tr>
<td></td>
<td>Bimatoprost 0.03%</td>
<td>Cross over</td>
<td>Duration 1m</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Travoprost 0.04%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quaranta 2008</td>
<td>Latanoprost 0.005%</td>
<td>40 pts</td>
<td>Wash out 6w</td>
<td>≤21</td>
<td>No significant difference in IOP or blood pressure</td>
</tr>
<tr>
<td></td>
<td>Bimatoprost 0.03%</td>
<td>Cross over</td>
<td>Duration 8w</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Travoprost 0.04%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quaranta 2006</td>
<td>Latanoprost 0.005%</td>
<td>27 pts</td>
<td>Wash out 4w</td>
<td>24.2</td>
<td>All drugs decreased IOP but latanoprost lowered it more. Some effect on blood pressure with Timolol and Brimonidine.</td>
</tr>
<tr>
<td></td>
<td>Timolol 0.5%</td>
<td>Cross over</td>
<td>Duration 6w</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brimonidine 0.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dorzolamide 2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yildirim 2008</td>
<td>Latanoprost 0.005%</td>
<td>17</td>
<td>Wash out NS</td>
<td>22.3</td>
<td>IOP was reduced with the 3 drugs with no significant difference between the 3</td>
</tr>
<tr>
<td></td>
<td>Bimatoprost 0.03%</td>
<td>16</td>
<td>Duration 8w</td>
<td>22.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Travoprost 0.04%</td>
<td>15</td>
<td></td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Summary table for circadian studies
In a randomized 8-week trial, Yildrin (2008) compared latanoprost, bimatoprost and travaprost in 48 participants with IOP greater than 22 mmHg who had not previously received IOP lowering therapy. All three medications lowered IOP at all time points. The only observed difference between the medications was travaprost lowered IOP more than the other two at 8 a.m. and 10 a.m.

Orsalezi (2006) compared latanoprost, bimatoprost and travaprost in 44 patients with either primary OAG or ocular hypertension (OHT) and IOP greater than 21 mmHg, who had not previously received prostaglandin. The trial was a randomized cross-over study in which patients used the drugs for 1 month prior to each 24-hour measurement. All three medications lowered IOP by about 7 mmHg, however bimatoprost lowered IOP more at most time points by about one mmHg. None of the medications had any effect on blood pressure.

The grading of evidence for circadian studies is summarized in Table 5.

### Table 5. Grading of evidence for circadian studies

<table>
<thead>
<tr>
<th>Number of Studies; Participants</th>
<th>Risk of Bias</th>
<th>Consistency</th>
<th>Directness</th>
<th>Precision</th>
<th>Strength of Evidence</th>
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<td>5; 186</td>
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</table>

**Conclusions**

Of the available monotherapies, prostaglandins appear to lower IOP most throughout the circadian period. Combination timolol/dorzolamide appears to be equally effective. Most findings are from single studies comparing specific agents, so the evidence is relatively weak. The importance of fluctuations in IOP throughout the 24-hour period on long-term outcomes for glaucoma patients is not known. Studies looking at fluctuation in eye pressure over long periods of time have had inconsistent results with some reporting worse outcomes with greater fluctuations and others reporting no difference.

**KQ 4a: What is the comparative effectiveness of medical treatments for preventing or slowing the progression of optic nerve damage and visual field loss?**

**Key Points**

- A systematic review of medical treatment for glaucoma determined treatment to be protective against progressive visual field loss. This review included the results of both the Early Manifest Glaucoma Trial and the Ocular Hypertension Treatment Study.
- Other included primary studies are of insufficient size or duration to detect differences in the rates of optic nerve damage or visual field loss. Given the slowly progressive nature of glaucoma, the large trials of glaucoma therapy (summarized elsewhere) have demonstrated the need to follow hundreds of participants for 5 or more years to detect change.
- A single study addressed the comparative effectiveness of glaucoma medications with respect to their ability to prevent optic nerve damage or visual field loss and found brimonidine superior to timolol.
Summary of Evidence From Systematic Reviews

Vass (2007) reported that any topical medical treatment (including beta blockers and studies with unspecified topical medications) had a significant protective effect on incident visual field defect progression when compared to placebo or no treatment (odds rations [OR]. 0.62; 95% CI, 0.47 to 0.81, 10 trials). Beta blockers were also protective when compared to placebo (OR, 0.67; 95% CI, 0.45 to 1.00, eight trials), as was timolol when compared to carteolol. Participants randomized to timolol, however, experienced a twofold higher odds of visual field defects when compared to participants receiving levobunolol (95% CI, 1.17 to 4.14, two trials).

Detailed Analysis of Primary Studies

Two studies reported an improvement in visual field with topical medical treatment. Prata (2009) showed an improvement in mean deviation across their entire population of subjects taking timolol, brimonidine, or travoprost. This was only a 4-week study and included no control group. The study of betaxolol versus levobunolol by Marcon (1990) found one subject of 20 whose visual field improved over 12 weeks of treatment, though criteria were not specified. An additional seven studies found no change in visual field parameters. The subanalysis of the Ocular Hypertension Treatment Study by Herman (2006) regarding cataract formation, reported no statistically significant change in either foveal sensitivity or visual field mean deviation. An evaluation of dorzolamide-timolol versus travoprost versus latanoprost showed no change in mean deviation or pattern standard deviation after 9 months. A comparison of timolol to betaxolol by Rainer (2003) revealed an improvement in the mean deviation for the betaxolol group alone but no significant difference in final mean deviation between the two groups. The study of timolol, metipranolol, and carteolol by Mirza (2000) did not find any change in visual field parameters over 3 months. Using a custom analysis of visual field point clusters of the Octopus G1 pattern, Vainio-Jylha and Vuori (1999) found no changes in visual fields over their 24-month study of betaxolol and timolol. Finally, the study of timolol versus carteolol by Yamamoto (1996) found no change in visual field over 16 weeks.

An additional nine studies were identified in which visual field measures worsened. The crossover study of latanoprost and timolol by Evans (2008) did not report on all visual field outcomes but did find that the latanoprost-then-timolol group had a statistically significant worsening of mean deviation (-1.49 to -2.41, p=0.04). Dirks (2006), comparing latanoprost to bimatoprost, found one subject in the latanoprost group worsened by unspecified visual field criteria. The European Glaucoma Prevention Study compared dorzolamide to placebo and found that in both groups, visual field worsened at a similar rate over 5 years. Using a custom analysis of visual field point clusters of the Octopus G1 pattern, Vainio-Jylha and Vuori (1999) found no changes in visual fields over their 24-month study of betaxolol and timolol. Finally, the study of timolol versus carteolol by Yamamoto (1996) found no change in visual field over 16 weeks.

Without clear statistical analysis, they report that the slope of the mean sensitivity in the betaxolol group was more positive. Another study of carteolol and timolol using the Octopus G1 pattern reports the distribution of the slope of the mean defect. This analysis seems to show disease progression in both groups but there are no analyses. Finally, Berry (1984) compared timolol and betaxolol and found that three of 35 eyes treated with betaxolol and two of 43 eyes treated with timolol worsened, although their conclusion was that this was due to “normal variation.”
The Low-pressure Glaucoma Treatment Study (Krupin 2011) compared brimonidine to timolol in subjects with glaucoma at normal IOP. The investigators found the brimonidine group was significantly less likely than the timolol group to have visual field progression (9% vs. 39.2%, p=0.001).

One additional study (Martinez 2010) compared dorzolamide added to timolol with brinzolamide added to timolol and found that there was less visual field progression in the group receiving dorzolamide.\(^5^7\)

Only one additional primary study was identified that addressed optic nerve changes. The European Glaucoma Progression Study found statistically similar risk of disease progression (by optic disc criteria) in the dorzolamide and placebo groups.\(^5^3\)

The grading of evidence for KQ 4a with all the domains is summarized in Table 6.

<table>
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<tr>
<th>Number of Studies; Participants</th>
<th>Risk of Bias</th>
<th>Consistency</th>
<th>Directness</th>
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<td>Optic Nerve Changes</td>
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<td>RCT/Low</td>
<td>N/A</td>
<td>Direct</td>
<td>Imprecise</td>
<td>Insufficient</td>
</tr>
</tbody>
</table>

Conclusions

A systematic review of medical treatment for glaucoma found treatment to be protective against visual field progression. Most other studies were not large enough or not of a long enough duration to detect differences in the rates of optic nerve damage or visual field loss. No other systematic reviews or individual studies addressed the comparative effectiveness of glaucoma medications with respect to their ability to prevent optic nerve damage or visual field loss.

Most of the primary studies found in our search were of inadequate duration to detect any changes in the optic nerve or visual field. Of the large studies evaluating medical therapy for glaucoma, both the Ocular Hypertension Treatment Study and the Early Manifest Glaucoma Study (which also included treatment with laser trabeculoplasty) showed a decreased rate of visual field loss and progressive optic nerve damage in those subjects treated with medications. Among such studies, only the European Glaucoma Prevention Study (EGPS) failed to find such a difference between treatment and placebo. Two important limitations of the EGPS were the relatively high loss to follow up and the fact that the response to placebo treatment was significantly higher than in prior studies. Based on the results of the Ocular Hypertension Treatment Study and the Early Manifest Glaucoma Trial, medical treatments decrease the risk of progression by 50 percent or less.

Only one of the primary studies was appropriately designed to compare rates of progression by visual field or optic nerve criteria between any two or more medications and found that brimonidine was superior to timolol in this regard.

Note that one key study in this area, the Ocular Hypertension Treatment Study (OHTS) is included in the discussion of a systematic review that is discussed in the section for KQ 4 in the medical versus surgical treatments, below.
KQ 6a: What are the harms associated with medical treatments for open-angle glaucoma?

Key Points
- The prostaglandin agents produce more ocular redness than does timolol (beta-adrenergic blocker). (Systematic review)
- Within the prostaglandins, latanoprost is less likely to cause redness. (Systematic review)
- Subjects on timolol (beta-blocker) were less likely to drop out of studies due to side effects than those on brimonidine (alpha-adrenergic agonist), latanoprost (prostaglandin analog), travoprost (prostaglandin analog), or betaxolol (beta-blocker). (Systematic review)

Summary of Evidence From Systematic Reviews
Bimatoprost was associated with a higher risk of conjunctival hyperemia when compared to other prostaglandin analogs. Aptel (2008) noted that the risk of conjunctival hyperemia was 1.7 times as high among participants receiving bimatoprost when compared to participants receiving latanoprost (95% CI, 1.44 to 2.02, five trials). 18 Cheng (2008), Eyawo (2009), and Honrubia (2009) reported similar results for the same comparison. 19,20,23 Aptel (2008) and Li (2006) reported similar results after comparing bimatoprost to travoprost. 18,24 However, in one trial Eyawo (2009) found the opposite result (higher risk among those using travoprost). 20 Cheng (2008) further noted that there were no significant differences in other adverse effects such as eye irritation, ocular inflammation, cystoid macular edema, and iris pigmentation with use of bimatoprost versus latanoprost. 19

Aptel (2008), Eyawo (2009), Honrubia (2009), and Li (2006), reported the harms related to use of latanoprost versus travoprost. 18,20,23,24 In these systematic reviews, participants randomized to latanoprost were less likely to experience conjunctival hyperemia when compared to travoprost. From a meta-analysis of six randomized trials, Eyawo (2009) reported 49 percent lower odds of conjunctival hyperemia among participants exposed to latanoprost compared with those given travoprost. Li (2006) further noted that comparisons of travoprost 0.004 percent to travoprost 0.0015 percent in four trials showed that participants receiving travoprost 0.004 percent were at increased odds of conjunctival hyperemia compared to those receiving 0.0015% (OR, 1.64; 95% CI, 1.32 to 2.04). 24

There were no significant differences in reports of harms such as conjunctival hyperemia, dry eye, and increased pigmentation between latanoprost, brimonidine (α2 adrenergic agonist) or dorzolamide (carbonic anhydrase inhibitor) as reported by Fung (2007) and Hodge (2008). 21,22 However, there was an increased risk of fatigue reported by participants using brimonidine.

Li (2006), Loon (2008), Vass (2007), Zhang (2001) conducted separate comparison of timolol with brimonidine (α2 adrenergic agonist), prostaglandin analogs (travoprost, latanoprost), other β adrenergic antagonists, and placebo. 24,26,29 While there was a twofold increase in the odds of participant drop out due to drug-related adverse events among participants randomized to timolol versus betaxolol (OR, 2.40; 95% CI, 1.04 to 5.53, five trials), the odds of dropping out were lower among participants randomized to timolol when compared to those receiving brimonidine (OR, 0.21; 95% CI, 0.14 to 0.31, three trials). 29 As to the comparison of timolol with prostaglandin analogs, participants receiving either travoprost 24 or latanoprost 25 had six times the odds and twice the odds, respectively, of dropping out of the study due to
conjunctival hyperemia, compared to patients receiving timolol. Both drugs also significantly increased iris pigmentation.

Conjunctival hyperemia and iris pigmentation were also significantly related to use of lantanoprost when compared to fixed and concomitant administration of timolol and dorzolamide. Cox (2008) concluded that adverse event reporting in studies of fixed versus concomitant medication formulations was inconsistent and the authors were thus unable to determine whether reports were associated with use of medications under investigation.28

**Detailed Analysis of Primary Studies**

We included 17 randomized controlled trials 32,33,37-39,41,42,49,52,53,55,58-63 and 10 observational studies 64-73 that reported harms of medical treatment (See evidence tables 11 and 12 in Appendix C).

**Conjunctival Hyperemia**

Conjunctival hyperemia is the most commonly reported adverse effect among the observational studies of medical treatment for OAG. Denis (2010) conducted an open label uncontrolled 3-month study of once-daily use of 0.005 percent latanoprost in 258 ophthalmology practices that included 600 participants with OHT or OAG. 64 Conjunctival hyperemia occurred in 10.7 percent of participants with an IOP between 20 and 23 mmHg and in 8.5 percent of participants with an IOP of 24 mmHg or greater. Eye pain was also reported among 3% of participants in each group. Chiselita (2007) conducted an open label study of travoprost among 1,133 participants (1,109 analyzed). 68 The most frequently reported adverse event was conjunctival hyperemia (6%) with severe cases requiring the withdrawal of travoprost in 10 participants. Thelen (2006) reviewed medical data for 353 OHT participants treated with lananoprost for approximately two years. 69 During this period the most frequently reported adverse event was ocular hyperemia, occurring in 20.7 percent of participants (73). Zimmerman (2003) conducted a historically controlled study of 3,534 participants (3,245 analyzed) who were switched from prior monotherapy to latanoprost. 70 Over the 6 months of follow-up the most frequently reported adverse effect was conjuntival hyperemia occurring in 2 percent of participants, and burning eyes, occurring in 1.4 percent of participants.

**Other Harms**

Barnett (2010) conducted a retrospective analysis of 1,636 Ocular Hypertension Treatment Study participants to determine the risk of retinal vein occlusion (RVO) among those randomized to medication versus those randomized to no treatment. Although there were 26 cases of RVO, the proportion of participants who developed RVO over 9 years of followup was 1.4 percent in the medication group and 2.1 percent in the control group (p = 0.14). 65

Farris 2008 conducted a retrospective study of 97 participants with 188 eyes receiving various medications in addition to latanoprost who were switched to travoprost. Within 3 months, one subject experienced irritation severe enough to warrant a change back to latanoprost (1.6%). 66

Sharpe (2007) reviewed the charts of 236 participants using latanoprost and 137 using bimatoprost. Within 12 months of treatment, 6 percent of participants receiving bimatoprost and 1 percent receiving latanoprost experienced periocular pigmentation (p = 0.004). 67

Arıcı (2000) compared the occurrence of ocular surface adverse effects among 24 OAG participants receiving betaxolol, 27 OAG participants receiving timolol, 26 OAG participants
using betaxolol and dipivefrin hydrochloride, and 30 control participants. OAG participants using topical medications were more likely to have fewer normal results from Schirmer’s tests and tear break up time tests and also have higher conjunctival impression cytology scores (p < 0.01) than those in the control group.71

**Grading of Evidence**

Because studies assessed a variety of different harms we did not complete a grading of evidence table for this question. There are a number of issues with assessing harms. For example, harms were not the primary outcome for the studies, meaning that the studies were not powered to detect differences. We judged the overall strength of evidence to be insufficient to make firm determination of differential harms for one therapy compared with another.

**Conclusions**

The harms of medical therapy for glaucoma are not consistently reported in a way that allows them to be easily analyzed across studies. Of the currently used medications, the prostaglandin agents are more likely to cause conjunctival hyperemia (redness) than timolol. Within the class of prostaglandins, latanoprost is less likely to cause redness than travoprost or bimatoprost and all three agents are similar with regard to ocular irritation, inflammation, cystoid macular edema, and iris pigmentation.

In a systematic review of timolol compared to other medications, subjects taking brimonidine, latanoprost, travoprost, or betaxolol were more likely to drop out of a study due to side effects than subjects taking timolol.

**Surgical Treatment of Open-Angle Glaucoma**

**Systematic Reviews of Surgical Interventions for Open-Angle Glaucoma**

We included 10 systematic reviews that address the comparative effectiveness of surgical interventions for the treatment of OAG (Appendix C).

Chai (2010) and Cheng (2010) discuss comparisons of viscocanalostomy versus trabeculectomy,74 75 with Cheng (2010) also compared viscocanalostomy to trabeculectomy with antimetabolites and deep sclerectomy to trabeculectomy (with or without antimetabolites).75

Wilkins (2005) and Wormald (2001) reviewed RCTs that compared primary trabeculectomy with antimetabolites versus trabeculectomy with placebo versus no treatment.76,77 Wilkins (2005) included trials of the antimetabolite mytomycin C (MMC) and Wormald (2001) included trials of 5-Fluorouracil.

Kirwan (2009) compared trabeculectomy with beta radiation versus trabeculectomy with or without placebo.78

Rolim de Moura (2007) assessed the effectiveness of diode versus argon laser trabeculoplasty as well as SLT or trabeculectomy versus argon laser trabeculoplasty.79

Minckler (2006) compared the individual effectiveness of various aqueous shunts. The study also compared the effectiveness of these shunts with trabeculectomy and endocyclophotocoagulation.80

Finally, we identified four reviews addressing the comparative effectiveness of treatments for coexisting cataract and glaucoma.7,76,81,82 Comparisons include one-site versus two-site
phacotrabeculectomy; extracapsular cataract extraction or phacoemulsification and trabeculectomy with intraoperative (MMC) versus extracapsular cataract extraction or phacoemulsification and trabeculectomy with placebo or no treatment or with a postoperative injection of 5-Fluorouracil versus placebo or no treatment.

KQ 1b: What is the comparative effectiveness of laser and other surgical treatments for reducing visual impairment?

Key Points
- No studies reported on visual impairment after laser or other surgical treatments.
- We could not determine whether individual patients sustained a clinically important decrease in visual acuity, because in all our identified studies comparing laser and other surgical treatments for glaucoma, visual acuity outcomes were reported as a mean value and not assessed as a primary outcome.
- No single treatment appeared to have a greater effect on visual acuity than any other treatment.

Summary of Evidence From Systematic Reviews
Liu (2010) and Minckler (2006) addressed visual acuity outcomes after surgical treatment of glaucoma. Liu (2010) found no difference in the percentage of patients with a post operative best corrected visual acuity of 20/40 or better (two trials) when one-site phacotrabeculectomy was compared to two-site phacotrabeculectomy. Minckler (2006) reported that participants receiving endocyclophotocoagulation had a 0.24 higher mean difference (worse) in logMAR visual acuity at 24 months when compared to those receiving the Ahmed implant. A comparison in one trial of single plate Molteno implant with corticosteroids versus single plate Molteno implant alone revealed that participants receiving the implant with corticosteroids were 22 percent more likely to have stable vision at followup (unchanged or within one line difference from baseline) than those receiving the implant only. None of these differences were statistically significant.

Detailed Analysis of Primary Studies
We did not identify any studies that reported on the primary outcome of visual impairment. We identified four studies that reported on the secondary outcome of visual acuity.

De Jong (2009) reported a change from baseline visual acuity at 12 months in an RCT comparing trabeculectomy with Ex-press minishunt, both using intraoperative mitomycin C (MMC) at a concentration of 0.2 mg/ml (the duration of exposure was not specified). Visual acuity was measured on an Early Treatment of Diabetic Retinopathy Study chart, but the manuscript does not specify whether patients were refracted either preoperatively or at 12 months. Two-thirds of patients had visual acuity that was unchanged, and about one-sixth had improved visual acuity and about one-sixth had decreased visual acuity. No definition of what constituted a change in acuity was provided.

Russo (2008) reported logMAR visual acuity results at 4 years in a trial in which patients received either a trabeculectomy or a non-penetrating deep sclerectomy with hyaluronic acid implant, both with MMC 0.2 mg/ml for two minutes. They report that the mean logMAR visual acuity in the trabeculectomy eyes changed from 0.8 (+/- 0.1) preoperatively to 0.4 (+/- 0.1) at 4 years, and that in the nonpenetrating deep sclerectomy eyes the visual acuity changed from 0.7
(+/− 0.1) preoperatively to 0.6 (+/− 0.1) at 4 years. Although this would suggest an improvement in visual acuity after both procedures, especially in the trabeculectomy group, the authors conclusion that there was more vision loss in the trabeculectomy group makes their findings uninterpretable.

Mielke (2006) performed an RCT in West Africa comparing nonpenetrating deep sclerectomy with and without intraoperative application of 0.25 mg/ml of MMC for 2 minutes. In the group without MMC, three of 21 eyes (14%) lost more than two lines of Snellen acuity with a mean follow-up of 18.3 months, and in the group receiving MMC, three of 18 eyes (17%) lost more than two lines of Snellen acuity with a mean followup of 14.3 months.

Shaarawy (2005) randomly performed a nonpenetrating deep sclerectomy in one eye of 13 patients and a nonpenetrating deep sclerectomy with a collagen implant in the fellow eye. They report aggregate visual acuity, expressed in Snellen fractions. In the eyes not receiving the collagen implant the preoperative, two-year, and four-year acuities were 0.67 (+/− 0.18), 0.56 (+/− 0.20), and 0.58 (+/− 0.20), respectively, and in the eyes receiving the collagen implant 0.66 (+/− 0.30), 0.58 (+/− 0.30), and 0.57 (+/− 0.3), respectively. The authors comment that the postoperative acuity was no different from the preoperative acuity, but offer no statistical support for their conclusion.

Note that one important study including laser trabeculoplasty, the Early Manifest Glaucoma Trial (EMGT) is included in the discussion of medical treatments of glaucoma, above.

The grading of evidence for KQ 1b with all the domains is summarized in Table 7.

<table>
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<th>Number of Studies; Participants</th>
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<tbody>
<tr>
<td>4; 238</td>
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<td>Inconsistent</td>
<td>Direct</td>
<td>Imprecise</td>
<td>Low</td>
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</table>

Conclusions

The literature is uninformative in addressing the question of the comparative effectiveness of laser and other surgical procedures in reducing visual impairment from glaucoma because no studies provide data on visual impairment.

KQ 3b: What is the comparative effectiveness of laser and other surgical treatments for lowering intraocular pressure?

Key Points

- Trabeculectomy lowers IOP more than nonpenetrating surgeries. (Systematic review)
- The use of mitomycin-C intraoperatively with trabeculectomy results in lower IOP than when it is not used. (Systematic review)
- Other alterations in surgical technique, location of surgery on the eye, and adjuvants other than mitomycin-C have not been shown to result in an added pressure decrease. (Primary studies)
- The intraocular pressure lowering effect of combined cataract surgery and trabeculectomy is not affected by the location of the conjunctival incision or the presence or absence of a peripheral iridectomy but may be more in two-site (cataract and...
trabeculectomy performed using different incisions) than one-site (cataract and trabeculectomy performed using the same incision) surgery. (Systematic review)

- Laser trabeculoplasty effectively lowers IOP in glaucoma patients and effectiveness does not vary with the type of laser used. (Primary studies)
- The data available for the role of aqueous drainage devices in open-angle glaucoma are inadequate to draw conclusions. (Primary studies, Systematic review)

Summary of Evidence From Systematic Reviews

The authors of the included systematic reviews of trabeculectomy compared to non-penetrating filtering surgeries concluded that trabeculectomy is a more effective surgical intervention for lowering IOP. Chai (2010) noted that the mean IOP of participants receiving trabeculectomy was 3.64 mmHg lower at 12 months (six trials) and 3.42 mmHg lower at 24 months (three trials) than the IOP of participants treated with viscocanalostomy.74 The outcomes were statistically significant, but the included studies enrolled participants with primary chronic angle closure glaucoma (1.7% of total included participants). Cheng (2010) confirmed this finding among participants with OAG.75 In Cheng’s study, there were fewer participants achieving normal endpoint IOP without medications or surgery (complete success) after one year in the viscocanalostomy group when compared to the trabeculectomy group (RD, -0.16; 95% CI, -0.30 to -0.02; three trials) and to the trabeculectomy with antimetabolite group (RD, -0.39; 95% CI, -0.53 to -0.24; three trials).

In a meta-analysis of five trials comparing deep sclerectomy to trabeculectomy, fewer deep sclerectomy participants achieved complete success (RD, -0.10; 95% CI, -0.19 to 0.00).75 This finding was mirrored in an analysis of deep sclerectomy with MMC versus trabeculectomy with MMC (RD, -0.16, 95% CI, -0.32 to -0.01; two trials).

Wilkins (2005) and Wormald (2001) reported that the addition of antimetabolites to trabeculectomy significantly reduced IOP among participants enrolled in the included studies.76 Wilkins (2005) determined after pooling the results of two trials that participants receiving intraoperative MMC had an average IOP that was 5.41 mm Hg lower than participants receiving placebo or no treatment at 12 months. A similar finding was reported among participants receiving postoperative 5-FU (WMD, -4.67; 95% CI, -6.60 to -2.74; two trials).

The addition of beta radiation to trabeculectomy does not appear to reduce IOP more than trabeculectomy alone as Kirwan (2009) reported no difference in the mean IOP of participants treated with trabeculectomy and beta radiation compared to participants receiving trabeculectomy only, at one year after surgery (WMD, -0.97; 95% CI, -2.56 to 0.62; two trials).78

Rolim de Moura (2007) reported (in two studies) no difference in the risk of failure (defined as an IOP greater than or equal to 22) when diode and argon laser trabeculoplasty were compared at one year (relative risk [RR], 3.0; 95% CI, 0.37 to 24.17) and two years follow-up (RR, 0.50; 95% CI, 0.10 to 2.43) and when SLT was compared to argon laser trabeculoplasty at one year (RR, 1.27; 95% CI, 0.84 to 1.90).79 When argon laser trabeculoplasty was compared with trabeculectomy across two trials at 24 months, participants randomized to argon laser trabeculoplasty were 2.03 times more likely to have failed treatment than participants randomized to trabeculectomy (95% CI, 1.38 to 2.98).

Three of the four systematic reviews addressing surgical treatments for coexisting cataract and glaucoma include pooled results for IOP, but these analyses also include results of studies with angle closure glaucoma participants in addition to OAG participants. Liu (2010) pooled the results of five trials that compared one-site to two-site phacotrabeculectomy and concluded that
two-site phacotrabeculectomy significantly lowered IOP by an average of 6 percent more than
one-site phacotrabeculectomy, from baseline to 12 or more months after surgery. Wilkins
(2005) reported significant improvements in mean IOP at 12 months with the addition of MMC
to extracapsular cataract extraction with trabeculectomy when compared to placebo or no
treatment (WMD, -3.34; 95% CI, -4.16 to -2.51; three trials). Wormald (2001) noted no
significant difference in mean IOP at 12 months when postoperative 5-FU is used as an
antimetabolite versus placebo or no treatment (WMD, -1.02; 95% CI, -2.40 to 0.37). Jampel
(2003) provided a qualitative synthesis of the evidence on surgical treatment of coexisting
cataract and glaucoma from literature searches conducted between 1980 and April 2000. The
investigators found that use of the antimetabolite MMC improves outcomes and is more
beneficial than 5-FU, that there are no differences in outcomes with limbal- and fornix-based
conjunctival incisions, and that the risk of postoperative cataract increases with glaucoma
surgery. Jampel (2003) concluded that the evidence did not support use of one strategy for IOP
control over any other and that more research is needed particularly addressing the long-term
progression of visual field loss and optic nerve damage.

Minckler (2006) reported the results of trials of aqueous shunts for all types of glaucoma. Overall, trabeculectomy performed better than the Ahmed implant. The mean IOP in the
trabeculectomy group was 3.81 mm Hg lower than the IOP in the Ahmed implant group (two
trials). Outcomes from single trials comparing endocyclophotocoagulation and Ahmed implant
failed to show a difference in mean IOP at 12 months (MD 1.14; 95% CI, -1.93 to 4.21) and 24
months (MD, 0.66; 95% CI, -2.98 to 4.30). The comparisons of various shunts to each other or a
single shunt compared with or without the use of antimetabolites were from single studies
addressing these questions. Minckler (2006) reported no difference in mean IOP at 12 months
when the Ahmed or Molteno implants were compared with or without the addition of MMC.
Additionally there were no differences in high-pressure versus standard Ahmed implant, double-
plate Molteno and Schocket shunts and single-plate Molteno implants with or without use of oral
corticosteroids. As of the January 2006 search date for this review, there were few studies of
aqueous shunts and thus the authors concluded that the evidence was insufficient for reaching
any conclusions regarding the comparisons included in the review.

**Detailed Analysis of Primary Studies**

Trabeculectomy has long been considered the mainstay of incisional surgery for lowering
IOP. It is often performed at the same time as cataract surgery, because many patients have
concurrent cataract and glaucoma. We included 19 randomized controlled trials: Three involving
trabeculectomy technique, six evaluating adjuvants at the time of trabeculectomy, four
comparing trabeculectomy with variations of trabeculectomy or other glaucoma surgery, two
addressing surgical techniques in combined cataract and glaucoma surgery, two addressing
combining cataract surgery with glaucoma surgery other than trabeculectomy, and one studying
deep sclerectomy.

One additional primary study was identified comparing “low” energy SLT to normal energy
SLT.
Trabeculectomy Techniques

Location of Surgery
Sanders (1993) in Scotland randomized 60 presumably Caucasian patients undergoing fornix-based trabeculectomy without antifibrosis agent to three different ocular sites for the surgery: nasal, superior, or temporal. No patient had undergone previous laser or intraocular surgery. At 18 months after surgery, the mean IOP was 14.5, 17.5 and 18.2 mm Hg for the three sites respectively. The IOPs for the nasal versus the temporal sites were statistically significantly different (p = 0.01). Although the numbers were too small for statistical analysis, eyes with a nasal trabeculectomy seemed to have more discomfort, more wound leaks, and were associated with more corneal dellen.

Fornix Versus Limbus Conjunctival Incision
El Sayyad (1999) randomly assigned one eye to fornix-based trabeculectomy and one eye to limbus-based trabeculectomy in 28 patients undergoing bilateral first-time trabeculectomies. Postoperative injections of 5-FU were used. Starting from a similar preoperative IOP of 33 mm Hg in each eye, IOPs were similar in both eyes, with a mean of 12 mm Hg at one year after surgery and 13 mm Hg at 2 years after surgery. Two late bleb leaks were noted in the limbus-based eyes and none in the fornix-based eyes.

Laser Suture Lysis Versus Adjustable Sutures
Kobayashi (2010) randomized 50 Japanese patients with OAG undergoing a fornix-based trabeculectomy with MMC to either scleral flap sutures requiring laser suture lysis after surgery or adjustable sutures that could be manipulated with a forceps. Both groups had a preoperative IOP of approximately 27 mm Hg. One year after surgery the IOP was 12.9 mm Hg in the adjustable suture group and 12.3 in the laser suture lysis group.

Trabeculectomy With Adjuvants

Mitomycin C
Reibaldi (2008) recalled patients who participated in a clinical trial in which patients with primary OAG received a limbus-based trabeculectomy with either balanced salt solution or 0.2 mg/ml of MMC applied on a sponge for 2 minutes. The preoperative IOP was 25 mm Hg in both groups with an average of three medications in each group. Of the 133 patients who entered the study, 114 were re-examined at a mean of 10 years in both groups, with mean IOP of 13.3 mm Hg in the MMC treated group and 14.7 in the balanced salt solution group (p=0.014). Using Kaplan-Meier curves, the authors determined that the success rate, defined as an IOP of 18 mm Hg or less was 75 percent for MMC and 55 percent for balanced salt solution (p=0.02).

Length of Mitomycin C Application
Kim (1998) randomized phakic patients undergoing their first trabeculectomy to receive either a 0.50-1 minute or a 3-5 minute application of 0.5 mg/ml of MMC. A limbus-based conjunctival flap was used. These eyes were compared to a group of similar historical controls that did not received MMC. The preoperative intraocular pressures, which ranged from 29.7 to 32.7 mm Hg were not statistically significant. The mean intraocular pressure and mean number of postoperative medications at one year, estimated from the figures, were 15 mm Hg with one
postoperative medication, 12 mm Hg with 0.5 postoperative medication, and 11 mm Hg with 0.3 medications (for the no MMC, 0.5-1 minute exposure to MMC, and the 3–5-minute exposure to MMC groups, respectively).

5-Fluorouracil Versus Fibrinolytic Drug
Quaranta (2000) randomized eyes undergoing their first trabeculectomy, done with a fornix-based flap, to either postoperative injections of (5-FU) or sulodexide, a fibrinolytic drug, on 10, 17, 24, 31, and 38 days after surgery. Preoperative IOP was comparable in both groups at about 27 mm Hg, and at one year after surgery was 15.5 mm Hg in the sulodexide eyes and 14.8 mm Hg in the 5-FU eyes. There were two bleb leaks requiring surgical repair in the 5-FU group and none in the sulodexide group.

Olegen Implant
Rosentreter (2010) randomized 20 eyes of 20 Caucasian patients undergoing fornix-based trabeculectomy to either MMC 0.2 mg/ml for three minutes or an Olegen (porous collagen-glycosaminoglycan matrix) implant placed on top of the scleral flap. Despite the small number of patients limiting the power of the study, the authors were able to conclude that the IOP at one year after surgery (11.3 mm Hg for the MMC treated group and 15.6 mm Hg for the Olegen treated group) as well as the requirement for IOP lowering medications (0.0 for the mitomycin treated group versus 0.8 for the Olegen treated group), were both statistically significant (p=0.01 for IOP and p=0.05 for medications).

Amniotic Graft
Eliezer (2006) randomized 32 patients, undergoing trabeculectomy using a limbus-based incision without an antifibrosis agent, to either receive or not receive an amniotic membrane graft intraoperatively. The amniotic membrane graft was sewn to the sclera, over the trabeculectomy flap because of its potential to decrease scarring and improve the success of the surgery. At one year, the IOP was 15.2 mm Hg in the eyes not receiving amniotic membrane and 12.8 in eyes receiving amniotic membrane, however this difference was not statistically significant (p=0.3).

Polytetrafluoroethylene Membrane
Cillino (2008) performed an RCT to evaluate the effect of placing a pericardial expanded polytetrafluoroethylene membrane underneath the scleral flap during trabeculectomy in eyes without previous ocular surgery. Sixty Caucasian patients with either OAG or pseudoexfoliation glaucoma, were randomized to one of four groups: trabeculectomy alone, trabeculectomy with MMC, trabeculectomy with membrane, or trabeculectomy with both MMC and membrane. Preoperative IOPs ranged from 28 to 35 mm Hg. At one year after surgery, mean IOP ranged from 16.4 to 17.4 mm Hg, with no difference between the four groups. Avascular blebs were noted in eyes receiving MMC but not in the other two groups.
Trabeculectomy Compared With Trabeculectomy Variants and Other Glaucoma Procedures

Minitrab
Thimmarayan (2006) randomly assigned 60 eyes of 54 subjects to either a conventional trabeculectomy (although they do not describe the surgical technique) or a “mini-trabeculectomy” in which a smaller than usual fornix-based conjunctival flap is made, and in which a scleral tunnel is created instead of a scleral flap. Ten percent of the eyes received postoperative 5-FU on an “as needed” basis. IOP was lowered in both groups from 28 mm Hg preoperatively to 16 mm Hg 15 months after surgery. The mini-trabeculectomy group appeared to have more hypotony, and shallower anterior chamber depths in the immediate postoperative period, but evidently the differences did not reach statistical significance.

Das (2002) randomly assigned 80 eyes of 80 subjects with OAG to either a limbus-based trabeculectomy without antifibrosis agent or a fornix-based trabeculectomy using a small incision and avoiding Tenon’s capsule. The preoperative IOP was 30 mm Hg in each group. At one year after surgery the mean IOP was 18.9 in the trabeculectomy group and 16.6 mm Hg in the small incision group (p=0.6), with 0.38 IOP-lowering medications in the trabeculectomy group as opposed to 0.25 IOP-lowering medications in the small incision group (p=0.025). There were no differences noted in either early or later postoperative complications between the two groups.

Ex-Press Shunt
De Jong (2009) performed an RCT comparing two limbus-based trabeculectomies using MMC, one with the implantation of an Ex-press minishunt underneath a trabeculectomy flap and one without in 80 eyes of 78 patients. The preoperative IOP was 22.8 mm Hg in the Ex-press group and 21.5 mm Hg in the trabeculectomy group, and 1 year after surgery the respective IOPs were 12.0 mm Hg and 13.9 mm Hg, respectively (p=0.02). Complications were not common and similar between the two groups.

Deep Sclerectomy With SK-Gel
Russo (2008) enrolled 93 Italian patients with primary OAG, who had baseline IOP of about 25.5 mmHg and had not had previous surgery, in a randomized comparison of non-penetrating deep sclerectomy with SK-Gel versus traditional trabeculectomy with MMC, and followed subjects at three and four years. Mean IOP was similar between the two groups at 36 and 48 months, but on average fewer medications were required in the trabeculectomy group. At 4 years, the two groups appeared to have differential outcomes with 72 percent of the trabeculectomy group having IOP greater than 21 mmHg without medicines versus 51 percent in the deep sclerectomy group (p<0.05). However, there were no statistically significant differences in achieving this IOP criterion when allowing for medication use by patients. Cataracts and flat anterior chambers were more common with trabeculectomy. In summary, IOP outcomes were similar, but more medications were required in the deep sclerectomy group.
Combined Cataract and Trabeculectomy Surgery Techniques

Peripheral Iridectomy
Kaplan-Messas (2009) performed a small clinical trial in which patients undergoing either trabeculectomy with MMC (n=11) or combined phacoemulsification and trabeculectomy with MMC (n=36), were randomized to either receive, or not receive, a peripheral iridectomy at the time of surgery. Given that their power to detect differences between the two groups must have been low, they found no difference in reduction of IOP with or without peripheral iridectomy. One eye in the group without an iridectomy had iris incarceration in the wound as opposed to none in the group with an iridectomy.

Fornix Versus Limbus Conjunctival Incision
Kozobolis (2002) performed bilateral phacoemulsification and trabeculectomy with MMC using a two-site (separate incisions for the phacoemulsification and trabeculectomy) approach in 22 patients. One eye was randomly assigned to a fornix-based trabeculectomy and the other to a limbus-based trabeculectomy. At one year after surgery there was no difference in the mean IOP (15 mm Hg) or the mean number of IOP lowering medications (0.3). Although the numbers were small, the authors observed faster visual recovery after surgery in the fornix-based trabeculectomies but more bleb leaks.

Combined Cataract and Other (Non-Trabeculectomy) Glaucoma Surgery

Micro-Bypass Stent
Fea (2010) randomized patients with OAG under medical treatment needing cataract surgery to either phacoemulsification cataract surgery alone or phacoemulsification cataract surgery plus implantation of a single micro-bypass stent (iStent, Glaukos). The preoperative IOP was 17.9 mm Hg on an average of 2.0 medications in the iStent group and 17.3 mm Hg on an average of 1.9 medications in the control group. Sixteen months after surgery (after a one month washout of all IOP lowering medications) the IOP was lower in the group receiving the iStent (16.6 mm Hg) than in the group not receiving the iStent (19.2 mm Hg, p=0.04).

Comparing Trabeculectomy With Viscocanalostomy
Kobayashi (2007) randomized one eye of each of 40 Japanese patients with primary OAG and visually significant cataract to either phacoemulsification cataract surgery with limbus-based trabeculectomy or to phacoemulsification cataract surgery and viscocanalostomy. MMC was applied at a concentration of 0.4 mg/ml for 3 minutes. The preoperative IOP of the eyes randomized to viscocanalostomy was 24.0 mm Hg on an average of 2.8 medications. In the trabeculectomy group, IOP was 23.7 mm Hg on an average of 2.6 medications. There were no significant differences in IOP between the two groups at 1, 3, 6, and 12 months after surgery. At 12 months, the mean IOP was 14.9 mm Hg on an average of 0.2 medications in the viscocanalostomy group and 14.1 mm Hg on an average of 0.1 medications in the trabeculectomy group.
Other Glaucoma Operations

Deep Sclerectomy With and Without Mitomycin C

Mielke (2006) performed a small RCT of 39 Nigerian patients with POAG without prior surgery to assess the benefit of using MMC in deep sclerectomy. Deep sclerectomy (with or without MMC) resulted in an IOP of less than 18 mmHg at 18 months in less than 25 percent of both groups. The study was underpowered to determine if IOP differed between the two groups.

Laser Trabeculoplasty

One study compared argon laser trabeculoplasty to SLT. As initial laser treatment in subjects already on medical therapy, the two procedures showed similar efficacy with IOP decreasing 6.01 mmHg in the SLT group and 6.12 mmHg in the argon laser trabeculoplasty group (p = NS). When used in eyes that had failed prior angle treatment, SLT resulted in a greater reduction in IOP than argon laser trabeculoplasty (6.24 mmHg versus 4.65 mmHg, p<0.01).

Another study of titanium-sapphire laser trabeculoplasty compared to argon laser trabeculoplasty found no significant difference in the reduction of IOP between the two (8.3 versus 6.5 mmHg, p non-significant). Frenkel (1997) found that 35 applications over 120 degrees resulted in similar reduction of IOP when compared to 50 applications over 180 degrees (3.9 mmHg versus 4.4 mmHg, p=0.63).

Finally, Tang (2011) compared “low” energy SLT to normal energy SLT and found no difference in the rate of success at any time point up to 12 months.

The grading of evidence for KQ 3b with all the domains is summarized in Table 8.

Table 8. Grading of evidence for KQ 3b

<table>
<thead>
<tr>
<th>Number of Studies; Participants</th>
<th>Risk of Bias</th>
<th>Consistency</th>
<th>Directness</th>
<th>Precision</th>
<th>Strength of Evidence</th>
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<td>Intraocular Pressure</td>
<td>RCT/Medium</td>
<td>Consistent</td>
<td>Direct</td>
<td>Precise</td>
<td>Moderate</td>
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Conclusions

Trabeculectomy has been repeatedly demonstrated to lower IOP to a mean level in the low to mid teens. Its IOP lowering effect is potentiated by the use of MMC intraoperatively, but does not appear to be increased by alterations in surgical technique, or the addition of implants designed to improve wound healing. One small study reported slightly lower IOPs with the Express mini-shunt compared to trabeculectomy. Combined cataract surgery with glaucoma surgery lowers IOP more than cataract surgery alone, but less than trabeculectomy alone.

The studies identified regarding laser trabeculoplasty consistently show a decrease in IOP with treatment but are not adequate to draw strong conclusions with regard to the type of laser used or the number of applications.

The exclusion of the Tube versus Trabeculectomy (TVT) study is important to note. While the study was well designed and well executed, the patient population enrolled in the study did not exclusively have open-angle glaucoma. Other studies of glaucoma drainage devices were also not eligible for this review as they reflect the practice of using tubes in glaucomas other than open-angle and in complex cases.
Another important exclusion is the Advanced Glaucoma Intervention Study (AGIS). The results of the AGIS could not be included as a primary study because it enrolled angle closure glaucoma subjects as well as open-angle glaucoma. Even though the number of angle closure cases was small, the data were never analyzed using the open-angle group alone so there was no way to abstract the data from the study publications. The AGIS is an important study in glaucoma, however, and also supports the conclusion that both trabeculectomy and laser can be used to lower IOP in glaucoma patients. In terms of the fundamental question asked by the study – whether initial laser trabeculoplasty or initial trabeculectomy was preferable – the 10 year results suggested that initial laser trabeculoplasty was less likely to result in visual field change in black subjects while initial trabeculectomy was preferable in white patients.106

KQ 4b: What is the comparative effectiveness of laser and other surgical treatments for preventing or slowing the progression of optic nerve damage and visual field loss?

Key Points
- No studies comparing laser and surgical treatments were found for which data on whether these procedures slow the progression of optic nerve damage and visual field loss were reported.

Summary of Evidence From Systematic Reviews
- We did not identify any systematic reviews of surgical interventions for OAG that included outcomes related to optic nerve damage or visual field loss.

Detailed Analysis of Primary Studies
- We did not identify any primary studies of surgical interventions for OAG that included outcomes related to optic nerve damage or visual field loss. However, outcomes related to optic nerve damage and visual field loss are discussed in reference to KQ 4c, comparing the effectiveness of medical and surgical interventions.

KQ 6b: What are the harms associated with laser and other surgical treatments for open-angle glaucoma?

Key Points
- Trabeculectomy results in more complications than nonpenetrating surgeries. (Systematic review)
- The profile of harms does not differ between one- and two-site combined cataract and glaucoma surgery. (Systematic review)

Summary of Evidence From Systematic Reviews
- Chai (2010) and Cheng (2010) concluded that adverse effects were experienced more often by participants randomized to trabeculectomy when compared to participants randomized to other nonpenetrating filtering surgeries.74,75 Hypotony, hyphema, shallow/flat anterior chamber, and cataract were all more frequent among participants treated with trabeculectomy compared to viscocanalostomy and deep sclerectomy. Cheng (2010) additionally noted a significantly higher
risk of choroidal detachment among participants receiving trabeculectomy versus both viscoanocanostomy and deep sclerectomy.\textsuperscript{75}

Wilkins (2005) and Wormald (2001) reported harms for the addition of antimetabolites to primary trabeculectomy. The risk of epithelial toxicity was 5.85 times as great with the addition of postoperative 5-FU in participants receiving primary trabeculectomy (95% CI, 2.04 to 16.83).\textsuperscript{82} Wilkins (2005) noted that wound leak, hypotony, and cataract were more often reported among those receiving intraoperative MMC, but these differences were not statistically significant.\textsuperscript{76}

The addition of beta radiation to trabeculectomy resulted in significantly higher risk of cataract when compared to trabeculectomy alone (RR, 2.89; 95% CI, 1.39 to 6.00).\textsuperscript{78} The risk of hypotony was higher while the risk of bleb leaks was lower, but the confidence intervals overlapped the line of no difference.

Diode laser trabeculoplasty treatment resulted in a lower, but not significant, risk of peripheral anterior synechiae (RR, 0.54; 95% CI, 0.17 to 1.76, one trial) and early IOP spikes (RR, 0.66; 95% CI, 0.21 to 2.14, three trials) when compared to argon laser trabeculoplasty.\textsuperscript{79}

Reports of adverse effects across studies that addressed questions related to combined surgery for co-existing cataract and glaucoma varied by intervention under consideration. There were no differences in the risk of hyphema, choroidal detachment, and hypotony when one-site phacotrabeculectomy was compared to two-site phacotrabeculectomy.\textsuperscript{81} The odds of wound leak (1.88), hypotony (1.65), and endophthalmitis (3.44 and 1.14) were greater among participants randomized to receive MMC with trabeculectomy in addition to cataract extraction (Wilkins (2005)), as compared to the same surgery without MMC.\textsuperscript{76} Additionally the risk of wound leak was 17% lower among participants receiving postoperative 5-FU with cataract extraction and trabeculectomy while the risk of epithelial toxicity was three times greater among those receiving 5-FU (95% CI, 1.56 to 5.92), compared to the same surgery without 5-FU. As it was with primary trabeculectomy, epithelial toxicity was significantly different among participants exposed and not exposed to 5-FU.

Reports of the complications of aqueous shunts across the five trials included in the Minckler (2006) review were not amenable to meta-analysis due to the unavailability of key data from the original manuscripts.\textsuperscript{80} Minckler (2006) noted that there were limited reports of choroidal hemorrhage with the single-plate, double-plate, and pressure-ridge double-plate Molteno implants. One study reported several cases of choroidal complications, corneal complications, and strabismus with the 350-mm and 500-mm Baerveldt implants (13/55 and 19/52 respectively for choroidal hemorrhage; 17/55 and 19/52 for corneal failure; and 10/55 and 8/52 for strabismus). Other harms noted include no light perception, ptosis, tube exposure, retinal detachment, and infection.

**Detailed Analysis of Primary Studies**

We included 22 randomized controlled trials\textsuperscript{83-85,88-91,93-100,103,104,107-111} and three observational studies\textsuperscript{112-114} that addressed questions of harms related to surgical treatment of OAG.

Nassiri (2008) reviewed the medical records of 61 participants receiving one-site phacotrabeculectomy and 52 participants receiving two-site phacotrabeculectomy.\textsuperscript{112} Over a 1-year follow-up period, the percent difference in the mean of corneal endothelial cell area was greater with two-site phacotrabeculectomy (38.04%) than one-site (32.46%) (p<0.001), where a larger increase in cell area is worse.
Jeganathan (2008) conducted a case control study of 29 cases of delayed suprachoroidal haemorrhage (DSCH) identified over a 10-year period from a total of 2,752 glaucoma surgeries. 113 Prior intraocular surgery (pars plana vitrectomy and penetrating keratoplasty) was associated with a 4.4 higher odds of DSCH. Other risk factors included postoperative hypotony defined as an IOP less than or equal to 3 mm Hg within the first week (OR 2.7; 95% CI 1.8 to 4.3). There was no association of DSCH with combined surgeries or preoperative or immediate postoperative IOP.

Shingleton (2002) conducted a retrospective study of 117 participants (126 eyes) randomized to phacotrabeculectomy with MMC with peripheral iridectomy (PI) (66 eyes) or without PI (60 eyes). 115 The most frequently reported harms/complications included posterior capsule opacification among participants receiving PI (34.8%) and those not receiving PI (40%) and capsulotomy (22.7% and 11.7% among the PI and no-PI group respectively).

**Grading of Evidence**

Because studies assessed a variety of different harms, we did not complete a grading of evidence table for this question. There are a number of issues with assessing harms. For example, harms were not the primary outcome for the studies, meaning that the studies were not powered to detect differences. We judged the overall strength of evidence to be insufficient to make firm determination of differential harms for one therapy compared to another.

**Conclusions**

Trabeculectomy, when compared to the nonpenetrating procedures of deep sclerectomy or viscocanalostomy, produces more hypotony, hyphema, shallow anterior chambers, cataract, and choroidal detachment.

There is no clear difference in harms produced by one-site versus two-site combined cataract extraction and trabeculectomy.

The harms associated with glaucoma drainage devices have not been adequately compared to the harms of other procedures in the treatment of OAG.

**Medical Versus Surgical Treatment of Open-Angle Glaucoma**

This section summarizes systematic reviews, and any additional primary studies not included in those systematic reviews, of medical versus surgical treatment of OAG. It also includes various combinations of medical and surgical treatment versus other treatment (medical, surgical, or no treatment).

**Systematic Reviews of Medical Versus Surgical Interventions for Open-Angle Glaucoma**

We included two systematic reviews that summarize comparisons of surgical and medical treatments of OAG. One additional systematic review includes comparisons of medical and/or surgical treatments with a concurrent no treatment group among participants with ocular hypertension, OAG, or normal-tension glaucoma.

Burr (2004) summarized the evidence from three RCTs addressing the effect of initial medical treatment versus initial trabeculectomy for preventing the progression of visual field loss and optic nerve damage. 116 Two of the studies assessed patients with “severe” glaucoma, one assessed “mild” glaucoma and the final one did not state the baseline glaucoma status. Medicines
and surgical techniques have evolved since this review—two of the studies were initiated before 1990 when prostaglandins were not available. Furthermore, visual field testing has also evolved substantially.

Maier (2005) reviewed five clinical trials of participants with ocular hypertension randomized to either medical and/or surgical (laser or incisional) treatment to lower IOP or to no treatment. Rolim de Moura (2007) summarized the evidence from 19 randomized controlled trials comparing laser trabeculoplasty alone to medical treatment, another surgical treatment (trabeculectomy), and a different type of laser trabeculoplasty. Rolim de Moura (2007) also included comparisons of laser trabeculoplasty plus medical treatment to no treatment and comparisons of alternative trabeculoplasty techniques (six studies - not discussed in this report).

KQ 1c: What is the comparative effectiveness of medical versus surgical treatment for reducing visual impairment?

Key Points
- Although trabeculectomy may reduce the risk of vision loss compared to medical treatment after adjusting for demographic and comorbid factors, the body of evidence is limited and inconclusive. (Systematic review)

Summary of Evidence From Systematic Reviews
Burr (2004) reported that in two trials with reports of visual acuity outcomes, there were no significant differences in visual acuity (mean or loss of two or more Snellen lines) when trabeculectomy was compared to medical treatment. The investigators of a third trial reported that participants receiving trabeculectomy experienced a 53 percent lower risk of losing two or more Snellen lines of visual acuity (0.3 logMAR) after adjustments for demographic factors and comorbidities including cataract requiring surgery (95% CI, 0.31 to 0.74).

Detailed Analysis of Primary Studies
We did not identify any primary studies of medical versus surgical interventions for OAG that included outcomes related to visual impairment or visual acuity.

Grading of Evidence
Not applicable as we did not identify evidence from primary studies addressing this question.

Conclusions
There is limited evidence in the literature regarding visual acuity outcomes when comparing medical to surgical treatments for glaucoma.

KQ 3c: What is the comparative effectiveness of medical versus surgical treatment for lowering intraocular pressure?

Key Points
- Incisional surgery lowers IOP more than lasers or medications. (Systematic review)
- Initial treatment with lasers tends to reduce the need for medications to achieve the same IOP. (Systematic review)
Summary of Evidence From Systematic Reviews

Burr (2004) reported that the IOP of participants randomized in two trials to trabeculectomy was 6.14 mmHg lower than participants receiving medical treatment at one year (95% CI, 4.25 to 8.02). In the third included trial, the mean difference at one year was on average 3.6 mmHg lower with trabeculectomy (95% CI, 2.78 to 4.42).

In one trial, there was a 1.6 mmHg difference in IOP between 2 to 4 years of followup (95% CI, -0.69 to 3.89), and a 3.4 mm Hg difference in favor of trabeculectomy at 5 years (95% CI, 1.04 to 5.76, one trial). In another trial that followed participants for 5 years, the mean difference in IOP in the group receiving trabeculectomy was 1.9 mm Hg (95% CI, 0.85 to 2.95). This finding was not statistically significant.

Rolim de Moura (2007) reported that the relative risk of experiencing an IOP greater than or equal to 22 mmHg (failure) at one year among participants receiving argon laser trabeculoplasty versus continued medical treatment was 0.08 in one trial (95% CI, 0.02 to 0.31) and 0.41 in a second trial (95% CI, 0.22 to 0.77). At 24 months, the relative risk of failure was 0.80 with argon laser trabeculoplasty compared to medical treatment alone (95% CI, 0.71 to 0.91, two trials).

Detailed Analysis of Primary Studies

Only a small number of articles compared IOP outcomes between medical and surgical therapy and the treatments compared were dissimilar. We therefore did not perform meta-analysis.

Tuulolin (1989) enrolled 191 consecutive Finnish treatment-naive phakic patients with primary OAG or pseudoexfoliation glaucoma (PXG) in an RCT comparing laser trabeculoplasty to medical therapy. Outcomes from 39 participants were available at 1 year. Nearly half of the patients receiving laser were subsequently treated with medications. The reduction of IOP was slightly greater in the laser trabeculoplasty group.

Lai (2004) randomized one eye of each patient (n=29) to either SLT or medical therapy (baseline IOP was about 26 mmHg, medications used were not stated). While more medications were required in the eyes that did not have SLT, the IOP was lowered about 8.5 mmHg in both groups (however, nearly one-fifth required surgery within 5 years). Eyes treated with SLT required fewer medications over 5 years of follow-up (total 24 subjects).

Migdal (1986) was included in existing systematic reviews but we include a brief description here. In this study, Migdal (1986) randomized 168 primary OAG patients with IOP greater than or equal to 24 mmHg (mean around 35 mmHg) to medicines (pilocarpine, sympathomimetic, and/or timolol), laser (360 degrees in two sessions) or trabeculectomy without antimetabolite. Mean IOP was similar in the medicine and laser groups (around 21 mmHg with some having failed and advanced to other therapy) and around 14 mmHg in the surgery group at one year. Failures of each therapy were excluded from mean IOP reported values in all follow-up reports, but almost none of those assigned to surgery developed IOP greater than 22 mmHg whereas about 20% in the medicine group and 30% in the laser group had elevated IOP within 5 years (which meant that IOP could not be kept below 23 mmHg with pilocarpine alone).

The grading of evidence for KQ 4b with all the domains is summarized in Table 9.
Table 9. Grading of evidence for KQ 4b

<table>
<thead>
<tr>
<th>Number of Studies; Participants</th>
<th>Risk of Bias</th>
<th>Consistency</th>
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<td>Direct</td>
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Conclusions

IOP is lowered more by trabeculectomy than by laser or medical treatment. Treating with lasers lowers IOP and when compared to treating with medications reduces the number of medications needed to keep IOP at the same level.

KQ 4c: What is the comparative effectiveness of medical versus surgical treatment for preventing or slowing the progression of optic nerve damage and visual field loss?

Key Points

- Trabeculectomy may prevent more visual field loss than medicines when used as initial therapy in advanced glaucoma. (Systematic review)
- The Collaborative Initial Glaucoma Treatment Study (CIGTS) included surgical techniques and medications that are current and found no difference in change in visual field (but did not report on change in the optic nerve).
- Treatment of ocular hypertension with medicines preserves visual fields better than no treatment. (Systematic review)

Summary of Evidence From Systematic Reviews

Maier (2005) summarized the evidence from five RCTs, which randomized participants with ocular hypertension to either medical and/or surgical treatment to lower IOP, or to no treatment. Participants receiving topical medications were 44 percent less likely to experience progression of visual field loss and optic disc damage when compared to participants receiving no treatment (HR 0.56; 95% CI, 0.39 to 0.81). Among participants with primary OAG (two trials), medically and/or surgically treated participants were 35 percent less likely to experience progression of field loss and optic disc damage when compared to participants receiving no treatment. This finding was mirrored in a subgroup analysis (two trials) of participants with normal tension glaucoma (HR 0.70; 95% CI, 0.48 to 1.02).

Burr (2004) reviewed the evidence from three RCTs addressing the effect of initial medical treatment versus initial trabeculectomy for preventing the progression of visual field loss and optic nerve damage. In one trial, at a mean of 4.6 years of followup, 26 percent of participants undergoing trabeculectomy compared with 47 percent medically treated participants experienced progression of visual field severity of one stage or more (OR, 2.56; 95% CI, 1.12 to 5.83).

In the second trial that examined participants with IOP less than 22 mm Hg at 5 or more years of follow-up, visual field progression was more likely in medically treated participants than those receiving trabeculectomy. Using the mean of the first three visual field scores compared to the mean of the last three scores, medically treated participants scored on average four points higher than those in the trabeculectomy group (MD, 3.92; 95% CI, 2.02 to 5.82). In this same trial, the investigators found no difference in progression of visual field loss measured by
Humphrey automated perimetry in the trabeculectomy group (71%) versus the medical treatment group (63%) (OR, 0.69; 95% CI, 0.29 to 1.67).

In the third trial, there was no difference in the mean change in visual field score at one year in the unadjusted analysis (MD, -0.5; 95% CI, -1.10 to 0.10) and 5 years (MD, 0.30; 95% CI, -0.45 to 1.05), but the investigators reported a significant difference after adjusting for demographic factors (age, gender, race) and baseline visual field score. The medical treatment group’s change in visual field score was lower than the trabeculectomy group (MD, -0.36; 95% CI, -0.67 to -0.05) suggesting less progression among those receiving medical treatment. Further adjustments for the incidence of cataract requiring surgery resulted in mean scores that were not different among the groups of interest (MD, -0.28; 95% CI, -0.59 to 0.03).

Two trials included in the Rolim de Moura (2007) review compared ALT to medications in newly diagnosed glaucoma patients and reported on visual field outcomes. The risk of visual field loss among participants randomized to laser trabeculoplasty was 23 percent lower when compared to participants receiving medical treatment at one year (RR, 0.77; 95% CI, 0.46 to 1.28) and 30 percent lower at two years (RR, 0.70; 95% CI, 0.42 to 1.16).

Detailed Analysis of Primary Studies

A limited number of trials with optic nerve and visual field outcomes met our inclusion criteria. Given the methodological heterogeneity of these studies, we present a narrative summary of the results.

Two studies, included in existing systematic reviews, warrant mention. Jay (1989) enrolled 116 newly diagnosed patients with primary OAG who had untreated IOP greater than 25 mmHg on two occasions in an RCT comparing medical therapy (up to three medications followed by trabeculectomy) to trabeculectomy from 1980–1985. Additional therapy was provided at the discretion of the treating clinician. Visual fields were followed using a Tubingen perimeter and categorized by severity with a one grade worsening of the visual field considered “progression.” Those undergoing surgery had more stable fields than those started with medical therapy. Based on results from survival analysis, surgery appeared to preserve visual field more in those with mild field loss than those with more severe field loss at baseline. This study showed a benefit of surgery first on the visual field, but the baseline IOP was very high (in the upper 30s) for the group as a whole and the results may not apply to those with lower baseline IOP.

In a study included in the existing systematic reviews, Migdal (1986) assessed visual field outcomes using Friedman automated visual field tests in 168 POAG patients randomized to surgery, medicines (pilocarpine, sympathomimetics, and/or timolol) or laser SLT and found that visual field score did not change significantly over 5 years in the surgery group, but did worsen in both the other arms.

Our systematic review identified one eligible RCT. Tuuoloin (1989) enrolled 191 consecutive Finnish treatment-naive phakic patients with primary OAG or PXG in an RCT comparing laser trabecuoplastySLT to medical therapy and reported on 39 of these at one year. No significant changes in visual field or optic nerve were noted in the two groups, but duration of followup was short and the number of patients completing one year was small.

The grading of evidence for KQ 4c with all the domains is summarized in Table 10.
Table 10. Grading of evidence for KQ 4c

<table>
<thead>
<tr>
<th>Number of Studies; Participants</th>
<th>Domains Pertaining to Strength of Evidence</th>
<th>Consistency</th>
<th>Directness</th>
<th>Precision</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Field</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1;191</td>
<td>RCT/High</td>
<td>Not Applicable</td>
<td>Indirect</td>
<td>Imprecise</td>
<td>Insufficient</td>
</tr>
<tr>
<td>Optic Nerve Changes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1;191</td>
<td>RCT/High</td>
<td>Not applicable</td>
<td>Direct</td>
<td>Precise</td>
<td>Insufficient</td>
</tr>
</tbody>
</table>

Conclusions

Based on systematic reviews and additional primary studies, both medical and surgical treatments decrease the risk of incident or worsening of visual field loss, but initial surgery may be more effective in this regard.

KQ 6c: What harms are reported in studies of medical versus surgical treatments for open-angle glaucoma?

Key Points

- Trabeculectomy is associated with cataract worsening and an increased need for cataract surgery over time when compared to medical treatments for glaucoma. (Systematic review)
- Intraocular surgery rarely results in severe vision loss due to infection and or bleeding. These risks are not associated with medical or laser treatments.
- Laser trabeculoplasty can produce peripheral anterior synechiae, whereas medical treatment does not. (Systematic review)

Summary of Evidence From Systematic Reviews

Burr (2004) reported a significantly higher risk of cataract (OR, 2.69; 95% CI, 1.64 to 4.42) and cataract surgery at up to three years post intervention (HR, 2.72; 95% CI, 1.51 to 4.89) in the trabeculectomy group compared to the medication group. Surgical complications included serous choroidal detachment (11%), hyphema (11%), encapsulated blebs (12%), and shallow or flat anterior chamber (14%) (one trial, 517 eyes, but reports also encompass fellow eyes not enrolled in the trial).

Rolim de Moura (2007) reported an elevated risk of systemic (RR 4.88) and ocular (RR 1.5) adverse effects among participants receiving laser trabeculoplasty with beta blockers versus no treatment, but each of these outcomes were reports from single trials and were not statistically significant. There was, however, an 11-fold increase in the risk of peripheral anterior synechiae among participants randomized to argon laser trabeculoplasty when compared to participants receiving medical treatment (95% CI, 5.63 to 22.09, two trials).

Detailed Analysis of Primary Studies

We included two randomized controlled trials that reported harms related to medical versus surgical treatment of OAG. We did not identify any observational studies.
Harms were not covered in a systematic fashion in the primary studies and therefore the results could not be synthesized. The harms reported in the primary studies are summarized in Appendix C.

**Grading of Evidence**
Grading was not completed as harms were addressed in a variety of ways (i.e., different outcomes) in the two RCTs identified for this question.

**Conclusions**
The evidence is conclusive that intraocular glaucoma surgery increases the risk of cataract and cataract surgery when compared to laser trabeculoplasty and medical treatment. Laser trabeculoplasty does not carry the risk of ocular discomfort associated with intraocular glaucoma surgery or medications. Medical therapy can produce systemic harms that are not produced by trabeculoplasty or intraocular glaucoma surgery. Ocular side effects are greater in the first 2 years after trabeculectomy than with medical therapy, but are similar after 2 years. Intraocular glaucoma surgery carries the rare but serious risk of intraocular infection, which does not occur with laser or medical treatment.

**KQ 2: Do medical treatments, lasers and other surgical treatments improve patient-reported outcomes?**

**Key Points**
- There is no direct evidence regarding the impact of glaucoma treatment on patient reported outcomes
- Medical and surgical treatments reduce the patient’s fear of blindness compared to after diagnosis
- Several studies suggest that the type of glaucoma treatment does not have an influence on QOL.
- There is some evidence that among medical treatments, patients prefer those that are less frequently applied.
- Since there are unlikely to be any future trials with a placebo arm, it will not be possible to determine definitively if treatments improve patient-reported outcomes relative to no treatment. It will still be possible to compare the effectiveness of different treatments on patient-reported outcomes, however.

**Summary of Evidence From Systematic Reviews**
Two systematic reviews addressed the relationship between medical versus surgical treatment of OAG and patient-reported outcomes, and the included studies are summarized in the analysis of primary studies section that follows.  

**Detailed Analysis of Primary Studies**
We identified nine trials that met our eligibility criteria and assessed patient-reported outcomes. Three trials reported QOL outcomes and one of these also reported fear of blindness as a QOL outcome. Two trials reported patient preference. One trial reported patient satisfaction and convenience. Three additional trials used a QOL instrument that was not
publicly available and were not analyzed for that reason.¹²⁷-¹²⁹ We thus include six trials in our narrative summary.

Four trials compared medical treatments, including one that compared a solution to a gel. One trial compared trabeculectomy to medical treatment and another trial compared laser plus medical treatment to no treatment. The six trials varied in diagnosis, age, race and severity of glaucoma and risk of bias. We did not perform a meta-analysis due to appreciable variability in interventions, outcomes, and follow-up intervals. The studies are described in detail in Evidence Table 21 (Appendix C) and those included in the analysis are summarized in Summary Table below.

We present a summary of the studies included in the review of KQ 2 with interventions, outcomes and results (Table 11).

<table>
<thead>
<tr>
<th>Study</th>
<th>Design, Sample Size</th>
<th>Interventions</th>
<th>Outcomes</th>
<th>Overall Risk of Bias</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIGTS 2001¹²²,¹³⁰</td>
<td>RCT 607 patients,</td>
<td>Primarily trabeculectomy (with or without 5-fluorouracil) vs. Primarily medications, starting with topical beta-blocker</td>
<td>-QOL -Fear of blindness - Symptom (frequency and bothersomeness)</td>
<td>Low</td>
<td>- QOL: No differences. - Symptoms: Overall decrease in both groups. Surgical patients reporting 22% more symptom bothersomeness related to visual function -Fear of blindness decreased in both groups</td>
</tr>
<tr>
<td>EMGT 2005¹²³</td>
<td>RCT 255 patients</td>
<td>No treatment vs. Betaxolol and ALT,</td>
<td>-QOL</td>
<td>Low</td>
<td>No difference</td>
</tr>
<tr>
<td>Javitt 2000¹²¹</td>
<td>RCT 219 patients</td>
<td>Brimonidine vs. Timolol</td>
<td>-QOL</td>
<td>Medium</td>
<td>No difference</td>
</tr>
<tr>
<td>Solish 2004¹²⁶</td>
<td>RCT 492 patients</td>
<td>Timolol/ Dorzolamide fixed combination vs. Timolol and Brimonidine</td>
<td>-Convenience -Satisfaction</td>
<td>Medium</td>
<td>Both treatments were convenient for &gt;80% of patients and satisfied &gt; 82% of the patients.</td>
</tr>
<tr>
<td>Konstas 2003¹²⁵</td>
<td>Randomized cross-over trial 54 patients</td>
<td>Latanoprost vs. Timolol/Dorzolamide fixed combination</td>
<td>-Preference</td>
<td>Medium</td>
<td>80 % preferred latanoprost vs. 20% timolol/dorzolamide</td>
</tr>
<tr>
<td>Schenker 1999¹²⁴</td>
<td>Randomized cross-over trial 202 patients</td>
<td>Timolol Gel vs. Timolol Solution</td>
<td>-Preference</td>
<td>Medium</td>
<td>-71% preferred timolol gel vs. 29% timolol solution -compliance was higher with timolol gel</td>
</tr>
</tbody>
</table>

Outcomes

Quality of Life

Comparison between different treatment groups was made in three trials (Collaborative Initial Glaucoma Treatment Study - CIGTS 2001, EMGT 2005, Javitt 2000). The CIGTS Study, comparing medical treatment to surgical trabeculectomy, reported no significant time-specific
differences between treatment groups in either the Visual Activities Questionnaire Total or Peripheral Vision subscale scores; however, with the Acuity subscale, time-specific treatment group differences were observed at 2-, 6-, and 30-month followup periods, with more dysfunction reported by the surgically treated group. In addition, surgical patients reported approximately 22% more symptom bothersomeness on the Symptom Impact Glaucoma Total score. There were no treatment group differences noted in model-based results for the disease-specific measure of patient perceptions. In the EMGT, a Swedish version of the National Eye Institute Visual Function Questionnaire-25 was administered to subjects in the two arms of the study, those treated with laser trabeculoplasty and betaxolol 0.5%, and those who were not treated. Treatment was not associated with a change in the QOL as assessed by the National Eye Institute Visual Function Questionnaire-25. Lastly, Javitt (2000) compared brimonidine 0.2% and timolol 0.5% treated individuals over 4 months and QOL was assessed with the SF-36. The changes of the SF-36 scores only varied during the study from 1 to 3 units on a scale of 0-100, which was not statistically significant.

One study (CIGTS, 2001) assessed fear of blindness as a QOL outcome and found a decrease in both groups (pharmacological and surgical) throughout the course of the study. At baseline, 34% of all patients reported moderate amount or a lot of worry about blindness. After 5 years this number decreased to 11%. The authors could not detect any association between the initial treatment assignment and fear of blindness.

Satisfaction and Convenience
Solish (2004) assessed patient satisfaction and convenience after 1 and 3 months of treatment with either the fixed combination (both drugs in one bottle) of timolol 0.5 percent and dorzolamide 2 percent, or the unfixed combination (separate bottles) of timolol 0.5 percent and brimonidine 0.2 percent. They found no statistically significant differences between the two drugs alone and in fixed combination. Eight-seven percent of patients treated with the fixed combination of dorzolamide/timolol reported the treatment to be convenient versus 80 percent treated with the concomitant administration of the two drugs (p=0.056). Eighty-seven percent of patients treated with the fixed combination of dorzolamide/timolol were satisfied with the treatment versus 85 percent treated with the concomitant administration of the two drugs (p=0.643). The study was funded by the manufacturer of the fixed combination product.

Preference
In one trial (Konstas, 2003), the subjects preferred latanoprost over the fixed combination of timolol maleate/dorzolamide (80% vs 20%, p<0.0001), mostly because of convenience (latanoprost was administered only once a day). In the other trial (Schenker (1999)) the patients preferred timolol gel given once a day over timolol solution (71% vs 29%) given twice a day after 6 weeks on each treatment (p<0.001), because of the reduced frequency of administration.

The grading of evidence for KQ 2 with all the domains is summarized in Table 12.
### Table 12. Grading of evidence for KQ 2

<table>
<thead>
<tr>
<th>Number of Studies; Subjects</th>
<th>Risk of Bias: Design/Quality</th>
<th>Consistency</th>
<th>Directness</th>
<th>Precision</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quality of Life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3; 1081</td>
<td>RCT/ low</td>
<td>Consistent</td>
<td>Direct</td>
<td>Imprecise</td>
<td>Insufficient</td>
</tr>
<tr>
<td><strong>Satisfaction and Convenience</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1; 492</td>
<td>RCT/ medium</td>
<td>Not applicable</td>
<td>Direct</td>
<td>Imprecise</td>
<td>Insufficient</td>
</tr>
<tr>
<td><strong>Preference</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2; 256</td>
<td>Randomized cross-over/ medium</td>
<td>Consistent</td>
<td>Direct</td>
<td>Imprecise</td>
<td>Insufficient</td>
</tr>
<tr>
<td><strong>Fear of Blindness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1; 607</td>
<td>RCT/ low</td>
<td>Not applicable</td>
<td>Direct</td>
<td>Imprecise</td>
<td>Insufficient</td>
</tr>
</tbody>
</table>

### Conclusions

Open-angle glaucoma generally is asymptomatic until late in its clinical course, and treatment is generally considered to slow or stop the course of disease rather than improve symptoms. For this reason, it is understood that the initiation of treatment is not expected to improve patient-reported outcomes. Hence, the goal is to select an effective treatment with the least treatment-related adverse outcomes. Therefore, it is not surprising that few studies compare patient-reported outcomes before and after the initiation of treatment. In the EMGT, subjects treated with eye drops and laser treatment reported the same QOL as those subjects who were observed without treatment. In the CIGTS, patients undergoing trabeculectomy surgery reported more eye-related symptoms in the first 2 years after surgery when compared to the group randomized to medical treatment.

The reduction in fear of blindness with initiation of treatment in the CIGTS must be kept in context. These were newly diagnosed patients who had no fear of blindness before diagnosis, and so naturally would have had concerns about blindness after learning of their diagnosis. This fear of blindness diminished over time, possibly as they realized that there was not rapidly losing vision, and was not clearly a treatment effect.

**KQ 5: Does lowering intraocular pressure or preventing or slowing the progression of optic nerve damage and visual field loss reduce visual impairment and change vision-related quality of life?**

### Key Points

- We found no studies that adequately addressed the relationship between the intermediate outcomes of intraocular pressure reduction, prevention of optic nerve damage, or prevention of visual field loss and the outcomes of visual impairment and vision-related quality of life.
Summary of Evidence From Systematic Reviews

We did not identify any systematic reviews or well designed primary studies that address the relationship between the intermediate outcomes of IOP reduction, prevention of optic nerve damage, or prevention of visual field loss and the outcomes of visual impairment and vision-related QOL.

Detailed Analysis From Primary Studies

Two studies were identified in which some link was made between the intermediate outcomes of IOP reduction, prevention of optic nerve damage, and prevention of visual field loss and the final outcomes of decreased visual impairment and vision-related QOL.30 131 The study by Prata (2009) was motivated by the hypothesis that decreasing IOP alone can result in an improvement in visual function.30 All 54 subjects received pressure-lowering medication such that there was an overall reduction in IOP from 24.8 mmHg to 16.9 mmHg (p<0.001). After four weeks of treatment, the authors reported an increase in both visual field mean deviation from -6.56 to -5.72 (p=0.02) and a visual analog scale132 from 6.96 to 7.52 (p=0.045). These results, while suggestive that lowering IOP alone may be beneficial for visual function and patient-reported quality of vision, are severely limited by the fact that there was no control group that did not receive pressure-lowering medications.

The second study, by Montemayor (2001), is a cross-sectional evaluation of the relationship between quality of life, visual function, and numbers of glaucoma medications.131 While there were no significant correlations between objective measures of visual function (visual acuity, visual field mean deviation) and quality of life, they did find correlation between the Visual Function Assessment133 and quality of life as measured by the EQ-5D health status tool.134 These results only indirectly address KQ 5 by measuring the correlation between visual field damage and QOL, which does not imply a cause and effect relationship, and the study also does not consider reduction in visual field loss.

While these studies met our inclusion criteria, neither of them was adequately designed to provide reliable information on which to draw conclusions regarding KQ 5.

The grading of evidence for KQ 5 with all the domains is summarized in Table 13.

<table>
<thead>
<tr>
<th>Number of Studies; Participants</th>
<th>Risk of Bias</th>
<th>Consistency</th>
<th>Directness</th>
<th>Precision</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Impairment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2; 278</td>
<td>RCT and Observational (cross-sectional) studies/ Medium</td>
<td>Inconsistent</td>
<td>Indirect</td>
<td>Imprecise</td>
<td>Insufficient</td>
</tr>
</tbody>
</table>

Link Between Visual Field Loss and Visual Impairment

Although there are no studies linking any glaucoma treatment to differential effects on either visual impairment or patient reported outcomes, there have been a number of cross-sectional studies relating the degree of visual field loss due to glaucoma to both of these outcomes. While none of these studies was eligible for inclusion in this systematic review, some of this evidence
is discussed below in order to make it clear that treatment may affect the final outcomes in the analytic framework by slowing the loss of visual field.

In its most severe form OAG can cause total and irreversible bilateral blindness. Therefore there is no question that OAG can produce marked decreases in both patient reported outcomes and objectively observed functional limitations. Cross-sectional studies comparing patients with OAG with visual field loss to controls have demonstrated that both patient-reported and objectively observed function is diminished in glaucoma.

Walking and balance are important functions, particularly in the older age group most likely to have visual field loss from glaucoma. In a glaucoma focus group, difficulty walking was a common complaint. Forty-nine percent of patients described difficulties with steps, 42 percent described difficulty going shopping, and 36 percent described difficulty crossing the road. Similarly, questionnaires given to glaucoma patients demonstrated that two of the strongest correlates with binocular visual field loss were difficulty with stairs and bumping into objects. Observation of walking by patients with glaucoma provides objective evidence of problems to corroborate the patient reported outcomes. Patients with glaucoma walk more slowly than similarly aged controls, and walking speed is strongly correlated with mean deviation in the worse-eye visual field. A population-based comparison of walking in individuals with and without glaucoma demonstrated that patients with bilateral, but not unilateral, glaucoma walked slower, and bumped into objects more frequently. In the Salisbury Eye Evaluation Study, patients with bilateral, but not unilateral glaucoma had more trouble performing balance tasks such as semi-tandem and tandem stands, in which the heel of one foot is placed next to or in front of the big toe of the second foot.

Falling is one serious outcome that may result from difficulties with walking and balance. Glaucoma patients in the Singapore Malay Eye Study had four-fold higher odds of falling than non-glaucoma individuals after adjusting for visual acuity. Among Medicare recipients, glaucoma patients coded as visually impaired were more likely to have had a fall or accident (OR 1.6) and to have had a femur fracture (OR 1.6) when compared with glaucoma patients not coded to have visual loss.

Driving is a critical activity of daily living. Patients with glaucoma perceive more difficulty driving than control individuals without glaucoma, and perceived difficulty increases with worsening visual field damage in the better eye. Participants in the Salisbury Eye Evaluation Study with bilateral, but not unilateral, glaucoma had worse self-reported scores with regard to driving at night, suggesting that disability may occur primarily in patients with bilateral disease.

Difficulty with tasks involving near vision is more common in glaucoma patients than in persons without glaucoma. Altangerel directly tested the performance of glaucoma patients on an index of activities and identified searching for objects, reading, and manual tasks (placing a stick into holes of different sizes) as most related to the extent of visual field loss.

Therefore, with respect to varied important tasks of everyday living, individuals with visual field loss from glaucoma have worse self-reported visual abilities and measurably worse task performance than their counterparts without glaucoma.

Conclusions

Evidence from cross-sectional studies not included in this review, because these studies do not address the KQs in our analytic framework, supports the conclusion that more severe visual field loss results in more visual impairment and worse patient reported outcomes. This link is the
basis for current treatments, which are intended to slow visual field progression by lowering intraocular pressure. However, we found no studies showing a direct link between treatment and visual impairment or patient-reported outcomes, however. We also found no link between those final outcomes and the intermediate outcomes addressed by KQ 3 and 4. Future studies might advance the field by evaluating this indirect link.
Discussion

In the analytic framework we developed to structure this work, the ultimate outcome of treating open-angle glaucoma (OAG) is the prevention of visual impairment and the maintenance or improvement of patient-reported outcomes like quality of life. Key Questions (KQs) 1 and 2 directly evaluate these outcomes. Recognizing that studying these final outcomes of glaucoma treatment directly requires large studies of long duration, we also included in the analytic framework the intermediate outcomes of intraocular pressure (IOP), rate of visual field loss, and rate of optic nerve damage as each of these outcomes is very likely linked to the final outcome of visual impairment. KQs 3 and 4 address the link between treatment and these intermediate outcomes. In an effort to gather all evidence linking treatment to changes in visual impairment and quality of life, Key Question 5 was included to assess the link between the intermediate outcomes reported by most glaucoma trials (IOP, visual field, optic nerve) and the ultimate outcomes of visual impairment and self-reported declines in quality of life.

Because glaucoma can be treated both medically and surgically, our evaluation was further structured to compare medications to other medications, medications to surgeries, and surgeries to other surgeries. This was done because it made the most sense from a clinical perspective. The key questions were therefore each evaluated within each of these three categories.

We identified no studies that evaluated either medical or surgical glaucoma treatments with regard to their impact on visual impairment (KQ 1). Our methods were designed to use standard definitions of visual impairment based on visual acuity and visual field loss, but even alternative definitions of visual impairment did appear in any appropriate studies. Glaucoma is a slowly progressive disease and recent publications indicate that the average untreated glaucoma patient would require more than 20 years to lose most of his/her visual field.9 Most clinical trials cannot enroll a large enough number of subjects and follow them long enough to detect a difference in the proportion progressing to severe vision loss. A small number of studies provided data on visual acuity or visual field outcomes that might have been used to evaluate this question, but either the data reported were not adequate to determine rates of visual disability or the studies were of too short a duration to ascertain relative differences in glaucoma progression.

We also found the evidence linking treatment with relative changes in patient-reported outcomes (KQ 2) to be insufficient. There is some evidence that patients prefer less frequent dosing of medications and there is evidence that treatment of any kind reduces the fear of blindness compared to after diagnosis, but we found nothing linking treatment to more important outcomes like vision-related quality of life.

As mentioned above, we attempted to find an indirect link from treatment to the final outcomes via KQ 5. Again, no studies were found that adequately evaluated the link between any of the intermediate outcomes and the final outcomes in the analytic framework.

Taking KQs 1, 2, and 5 together, we therefore did not find evidence for direct or indirect links between treatment of glaucoma and the prevention of visual impairment or changes in patient-reported outcomes. As noted above, since glaucoma is a slowly progressive disease (even if untreated), it is not surprising that no studies of these links were identified. The required duration of such studies would present significant challenges, primarily in terms of the followup of the subjects for a long enough period of time to ascertain relative differences in the outcomes.

In contrast to the lack of evidence for KQs 1, 2, and 5, the past decade has seen significant progress in terms of information related to the intermediate outcomes of IOP (KQ 3) and changes in visual field and optic nerve (KQ 4). With regard to IOP, there is moderate evidence that a number of treatments can significantly lower IOP relative to no treatment.
Medical therapy for glaucoma has been available for over a century and there is moderate evidence that all of the currently used medications lower IOP. Among medications, the prostaglandin agents are consistently superior to the other classes in terms of their pressure lowering ability. Specifically, latanoprost has been shown to be superior to timolol, brimonidine, and dorzolamide. This result is consistent with the NICE guidelines from 2009 regarding glaucoma medications.\textsuperscript{145} It is also now clear from large clinical trials (Collaborative Normal-Tension Glaucoma Study, Early Manifest Glaucoma Trial, and Ocular Hypertension Treatment Study) that treatment with medications decreases the risk of visual field loss or optic nerve damage. The reduction in the risk of visual field loss or optic nerve damage was close to 50% in these major trials. The topical medications included in this review have been shown to be superior to placebo with regard to visual field loss and/or optic nerve damage, but there is not adequate evidence to suggest the superiority of one medication over another in terms of these same outcomes.

Laser trabeculoplasty has also been shown to decrease IOP in OAG. Although multiple types of laser are currently in use, there is no evidence to support the use of one technology over another. Specifically, our results, similar to the conclusions provided in the National Institute for Health and Clinical Excellence glaucoma guidelines,\textsuperscript{145} support the equivalence of argon laser trabeculoplasty and SLT. Furthermore, laser trabeculoplasty and topical medications have similar ability to prevent visual field loss due to glaucoma.

As with medications and laser, incisional surgeries lower IOP. In terms of relative effect, trabeculectomy lowers pressure more than non-penetrating procedures like viscocanalostomy and deep sclerectomy. There is also moderate evidence that trabeculectomy with the antimetabolite mitomycin-C lowers pressure more than the same procedure without mitomycin-C. Interestingly, there is no evidence to support a reduction in IOP when mitomycin-C is used with the non-penetrating procedures. Although many variations on the basic trabeculectomy have been evaluated, including differences in technique and in adjuvants, there is insufficient evidence that any of them provides additional reduction in IOP.

Based on the evidence we analyzed, it is likely that trabeculectomy is superior to medications in terms of preventing visual field loss. Taken together, the current best evidence supports the contention that medication and laser trabeculoplasty have similar efficacy but that trabeculectomy is superior to both with respect to the intermediate outcomes addressed by KQs 3 and 4.

There is, of course, a downside to any treatment in the form of side effects and complications. In general, the harms produced by medications are not vision threatening and most commonly include signs and symptoms like conjunctival hyperemia and ocular irritation. There is evidence that the prostaglandin agents are more likely to cause conjunctival hyperemia than are the other classes of medication, and that latanoprost is the least likely to cause this of the three prostaglandins that have been most widely used and studied (latanoprost, bimatoprost and travoprost). On the other hand, timolol is more likely to result in systemic side effects like shortness of breath or bradycardia, though these are rarely severe.

As expected, the complications of surgery are more significant compared to those of medications, and they include cataract formation, choroidal effusions, hyphema, and flattening of the anterior chamber. If these complications are severe, they can result in vision loss. Among surgical treatments, these complications are more common in trabeculectomy than in non-penetrating surgeries and are likely more common in trabeculectomies done with mitomycin-C than in those performed without it.
The fact that the treatment that is most likely to lower IOP and prevent visual field and optic nerve progression (trabeculectomy) is also the one with the most significant side effects is a challenge to clinical decision making. When deciding from among medications, laser, and incisional surgery, a clinician would ideally perform some sort of patient-specific risk-benefit analysis to determine which intervention is most appropriate, given the risk of progression. Even if this were something clinicians were good at, the fact is that there are no good studies that clearly quantify the relative risks and benefits of various treatments to inform such an analysis.

In conclusion, we did not find direct or indirect links between glaucoma treatment and visual impairment or patient-reported outcomes. This should be an area of focus in future glaucoma trials, but trials would need to be of adequate size and duration to detect differences between groups. We did find, however, that a number of current medical and surgical treatments clearly lower IOP and can prevent visual field loss and optic nerve damage. While we found direct comparisons between some treatments, the remaining gaps noted above also represent an area in which future research could be directed.
Future Research Needs

The available evidence regarding glaucoma treatments demonstrates definitively that intraocular pressure can be lowered by medications, laser treatments, and surgery. High-quality randomized controlled trials have also shown that reduction of intraocular pressure slows the development and progression of damage to the optic nerve and slows visual field loss. Although logical to presume that slowing glaucoma damage would lead to preservation of vision-related quality of life and reduction in visual impairment, this link has not been demonstrated in the research literature. Establishing this link is perhaps the most important next step in fleshing out the analytic framework presented above, thereby establishing (or not) the impact of treatment on the more meaningful final outcomes.

As part of this systematic review, it also became clear that most of the available literature on glaucoma treatments was deficient in one or more ways and therefore could not be used to answer the questions incorporated in the analytic framework. First of all, many studies had to be excluded because they were non-comparative or too small. In general, the lack of a control or comparison group precludes the kind of conclusions one would like to draw from a study, specifically whether a particular treatment is superior to another. Similarly, studies with inadequate sample sizes are also less informative than desired. The glaucoma treatment literature also contains many non-randomized studies. This seems to be a general deficiency in surgical fields where it is possible to implement new procedures or devices without the same level of oversight or approval found with medications. Regardless of the underlying reasons, the fact that subjects were not drawn from the same population and randomized to one of a number of treatments means that it is again difficult to draw any meaningful conclusions. All of these problems could be overcome with more rigorous study design, which should include at least two groups, preferably randomized, and some kind of a priori sample size calculation to increase the likelihood of being able to answer the question motivating the study in the first place.

It is not true that only prospective randomized studies should be conducted but other study designs need to be purposefully designed to answer some question. For example, large observational studies or clinical data registries could be used to assess harms of treatment that might not be detected in smaller, randomized studies. Similarly, these non-randomized designs could also provide information about the incidence or prevalence of visual impairment or disability among various groups.

Another category of deficiency in much glaucoma literature is with regard to the reporting of outcomes and harms for study populations. This may be due to the facts that there is no universally accepted measure of glaucoma or its progression (outcomes) and that there has also been no consensus regarding which harms should be reported and how. As such, the ability to combine results from multiple studies would be enhanced by more commonality with regard to study design. Fortunately, such a consensus is now available and the World Glaucoma Association publication “Guidelines on Design and Reporting of Glaucoma Surgical Trials” should serve as a basis for all trials of new and existing treatments.15

One area of glaucoma that has only recently received attention is that of formal risk estimation for patients. In the case of patients who are similar to the subjects of the Ocular Hypertension Treatment Study, it is possible to use a calculator to estimate their risk of conversion to glaucoma within 5 years. Production of similar calculators for other stages of disease (early, moderate, severe) and for other groups of glaucoma suspects (African Americans, Latinos, etc.) may help identify those patients most at risk of incident or progressive disease, thereby allowing treatment efforts to be better focused. Based on the results of the studies
described above, there is not yet compelling evidence that these groups would benefit from any particular approach to treatment.

Below, we utilize the Population, Intervention, Comparison, and Outcome framework to outline areas of research that might help resolve the deficiencies in prior work identified as part of this review.

**Lack of Association Between Treatment and Visual Impairment**

Population:
- Patients with moderate visual loss from glaucoma, that is, those at highest risk for visual impairment

Interventions:
- Studies evaluating all interventions are needed: medical therapy, laser trabeculoplasty, incisional surgery

Outcomes:
- Visual impairment as measured by standard definitions (e.g., International Classification of Diseases)
- Functional measures of impairment: reading, driving, other activities of daily living
- Long-term trials or patient registries (i.e., greater than 10 years) are needed to determine the relative impact of treatments on visual impairment
- All studies of glaucoma treatments should routinely include generally accepted measures of visual impairment

**Lack of Association Between Treatment and Patient-Reported Outcomes**

Population:
- Open-angle glaucoma patients in need of treatment

Interventions:
- Studies evaluating all interventions are needed: medical therapy, laser trabeculoplasty, incisional surgery

Outcomes:
- Assessment of patient-reported outcomes prior to the start of therapy to provide appropriate basis for assessing these outcomes after therapy
- Potential outcomes for consideration in future research include satisfaction with therapy, self-assessment of visual function, and concerns about future vision loss.

**Assessment of the Relative Risks and Benefits of Treatment**

Population:
- Glaucoma patients in need of treatment
- Provide subanalysis or complete stratification by risk

Interventions:
- Studies evaluating all interventions are needed: medical therapy, laser trabeculoplasty, incisional surgery
Outcomes:
- All studies of glaucoma treatments should be designed to provide information on the comparative effectiveness of one treatment versus the most appropriate “standard.”
References


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49. Mirza GE, Karakucuk S, Temel E. Comparison of the effects of 0.5% timolol maleate, 2% carteolol hydrochloride, and 0.3% metipranolol on intraocular pressure and perimetry findings and evaluation of their ocular and systemic effects. J Glaucoma 2000; 9(1):45-50.


57. Martínez A, Sanchez-Salorio M. Predictors for visual field progression and the effects of treatment with dorzolamide 2% or brinzolamide 1% each added to timolol 0.5% in primary open-angle glaucoma. Acta Ophthalmologica 2010; 88(5):541-52.


68. Chiselita D. Evaluation of the role of travoprost 0.004% ophthalmic solution in the management of open angle glaucoma and ocular hypertensive patients. Oftalmologia 2007; 51(2):81-6.


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## Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AHRQ</td>
<td>Agency for Healthcare Research and Quality</td>
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<td>CI</td>
<td>confidence interval</td>
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<td>EPC</td>
<td>Evidence-based Practice Center</td>
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<td>5-FU</td>
<td>5-Fluorouracil</td>
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<td>Mitomycin-C</td>
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<tr>
<td>SLT</td>
<td>selective laser trabeculoplasty</td>
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<td>WMD</td>
<td>weighted mean difference</td>
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Appendix A. Search Strategy

PubMed


EMBASE

('intraocular hypertension'/exp OR 'ocular hypertension':ab,ti OR 'intraocular pressure'/exp OR 'intraocular pressure':ab,ti OR 'open angle glaucoma'/exp OR 'open angle glaucoma':ti,ab OR 'low tension glaucoma':ti,ab OR 'normal tension glaucoma':ti,ab OR 'pseudoexfoliative glaucoma':ti,ab OR 'pseudoexfoliative syndrome':ab,ti) AND (trabeculectomy'/exp OR trabeculectomy:ab,ti OR 'laser coagulation'/exp OR 'laser coagulation':ab,ti OR photocoagulation:ab,ti OR 'glaucoma surgery'/exp OR sclerostomy:ab,ti OR canaloplasty:ab,ti OR viscocanalostomy:ab,ti OR 'glaucoma drainage implant'/exp OR 'glaucoma drainage implants':ab,ti OR shunt:ab,ti OR 'laser therapy':ab,ti OR 'laser surgery':ab,ti OR apraclonidine:ab,ti OR 'brimonidine'/exp OR brimonidine:ab,ti OR 'timolol'/exp OR timolol:ab,ti OR 'betaxolol'/exp OR betaxolol:ab,ti OR 'levobunolol'/exp OR 'metipranolol'/exp OR 'carbonate dehydratase inhibitor'/exp OR 'carbonic anhydrase inhibitors':ab,ti OR 'dorzolamide'/exp OR dorzolamide:ab,ti OR 'acetazolamide'/exp OR acetazolamide:ab,ti OR 'cholinergic receptor stimulating agent'/exp OR 'pilocarpine'/exp OR pilocarpine:ab,ti OR 'carbachol'/exp OR 'prostaglandin derivative'/exp OR prostaglandins:ab,ti OR travoprost:ab,ti OR bimatoprost:ab,ti OR latanoprost:ab,ti OR 'isopropyl unoprostone'/exp OR 'antihypertensive agent'/exp OR 'adrenalin'/exp OR epinephrine:ab,ti) AND (randomized controlled trial:pt OR 'controlled clinical trial':pt OR randomized:ab OR placebo:ab OR 'clinical trial'/exp OR randomly:ab OR trial:ti) NOT (animals/exp NOT humans/exp) 3480 titles
LILACS

glaucoma$ AND (Trabeculectom$ OR ‘Laser Coagulation’$ OR photocoagulation$ OR sclerostomy$ canaloplast$ OR viscocanalostom$ OR ‘glaucoma drainage implants’ OR ‘glaucoma drainage implant’$ OR shunt OR ‘laser therapy’ OR laser surgery OR apraclonidine OR brimonidine$ OR Timolol$ OR Betaxolol$ OR Levobunolol$ OR Metipranolol$ OR ‘Carbonic Anhydrase Inhibitors’$ OR dorzolamide$ OR Acetazolamide$ OR ‘Cholinergic Agents’$ OR Pilocarpine$ OR Carbachol$ OR Prostaglandins$ OR travoprost$ OR bimatoprost$ OR ‘isopropyl unoprostone’ OR ‘Antihypertensive Agents’ OR Epinephrine$) 276 titles

Cochrane

glaucoma AND (Trabeculectomy OR ‘Laser Coagulation’ OR photocoagulation OR sclerostomy canaloplasty OR viscocanalostomy OR ‘glaucoma drainage implants’ OR ‘glaucoma drainage implant’ OR shunt OR ‘laser therapy’ OR laser surgery OR apraclonidine OR brimonidine$ OR Timolol OR Betaxolol OR Levobunolol OR Metipranolol OR ‘Carbonic Anhydrase Inhibitors’ OR dorzolamide OR Acetazolamide OR ‘Cholinergic Agents’ OR Pilocarpine OR Carbachol OR Prostaglandins OR travoprost OR bimatoprost OR ‘isopropyl unoprostone’ OR ‘Antihypertensive Agents’ OR Epinephrine) 463
# Search Strategy

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<td>Only human studies</td>
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Include
Primary OAG
Secondary OAG
Ocular Hypertension
Normal tension glaucoma
Low tension glaucoma
Pigmentary glaucoma
Pseudoexfoliative

Exclude
Angle-closure glaucoma
Juvenile glaucoma
Traumatic glaucoma
Neovascular glaucoma

B Key Questions
KQ1: Do medical, laser, and other surgical treatments for open-angle glaucoma reduce visual impairment?
KQ2: Does treatment of open-angle glaucoma improve patient-reported outcomes?
KQ3: Do medical, laser, and other surgical treatments for open-angle glaucoma lower intraocular pressure?
KQ4: Do medical, laser, and other surgical treatments for open-angle glaucoma prevent or slow the progression of optic nerve damage and visual field loss?
KQ5: Does lowering intraocular pressure or preventing or slowing the progression of optic nerve damage and visual field loss reduce visual impairment and change vision-related quality of life?
KQ6: What are the harms associated with medical, laser, and other surgical treatments for open-angle glaucoma?
Ref: 12, Skateboards: Are they really perilous? A retrospective study from a district hospital.

Rothman U, Venkatesan RS, Shen A.

Exclude article if (please choose one)

- No original data (e.g., systematic review, narrative review, editorial, letter)
- No subjects with open-angle glaucoma (see A for other terms)
- Does not include treatment for open-angle glaucoma (medical, surgical or combined; see addendum for list of interventions)
- Does not address any key questions (see below for questions)
- Short term follow-up only (less than 1 month for medical study/year for surgical study) but is not a 24 hour study.
- It is a case report
- It is not an RCT and has less than 100 patients
- It is a randomized controlled trial published before April 2009
- Animal or in vitro data
- Data not abstractable
- Other (specify)

Clear Response

Include Article

Check the Key Question it addresses (you may check more than one)

- KQ1: Do medical, laser, and other surgical treatments for open-angle glaucoma reduce visual impairment?
- KQ2: Does treatment of open-angle glaucoma improve patient-reported outcomes?
- KQ3: Do medical, laser, and other surgical treatments for open-angle glaucoma lower intraocular pressure?
- KQ4: Do medical, laser, and other surgical treatments for open-angle glaucoma prevent or slow the progression of optic nerve damage and visual field loss?
- KQ5: Does lowering intraocular pressure prevent or slow the progression of optic nerve damage and visual field loss? Do other treatments reduce visual impairment and change vision-related quality of life?
- KQ6: What are the harms associated with medical, laser, and other surgical treatments for open-angle glaucoma?

Check the study design ONLY for included article

- Randomized Controlled Trial / Quasi-Randomized Controlled Trial / Randomized Cross-over
- Other trial (e.g., cross-over trials, before-after, switch, controlled trial)
- Observational study (cohort studies, case control studies)

Non-english article

B-3
A Glaucoma terms
Include
Primary OAG
Ocular Hypertension
Normal and low tension glaucoma
Pigmentary glaucoma
Pseudoexfoliative

Exclude
Angle-closure glaucoma
Juvenile glaucoma/Congenital
Traumatic glaucoma
Neovascular glaucoma
Refractory
Secondary glaucoma except for Pigmentary and Pseudoexfoliative

Submit Form and go to 1 or Skip to Next
Ref: 12. Skateboarders: Are they really perilous? A retrospective study from a district hospital.

Rothman U, Yeagupiari PS, Rinka A.

Please check for a 24-hour study

- 24-hour study

Please define comparators for each arm below:

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<th>Arm 2</th>
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Comments

This article should be excluded (specify reason)

Submit Form and go to | or Skip to Next
Ref: 12. Skateboards: Are they really perilous? A retrospective study from a district hospital.
Rethnam U, Venupalan R, Sitha A.

Study Design Characteristics

1. What study design was used? (check one):
   - Randomized Controlled Trial
   - Quasi-Randomized Controlled Trial
   - Randomized Cross-Over
   - Controlled Trial
   - Cross-Over Trial
   - Before-After Study
   - Switch Study
   - Cohort Study
   - Case Control Study
   - Case Series

2. Was the study:
   - Prospective
   - Retrospective

3. Is this study part of a bigger study? Please specify the citation number from the article.
   - Yes, specify which
   - No

4. Is this study part of a multicenter trial?
   - Yes
   - No
5. In what region did the study occur? (check all that apply):
- [ ] North America
- [ ] Europe
- [ ] Asia
- [ ] Africa
- [ ] Australia
- [ ] South America

6. Mean follow-up duration (select unit and value of duration):
- [ ] Days
- [ ] Weeks
- [ ] Months
- [ ] Years
- [ ] Not specified
- [ ] 24-hour study

**Study Eligibility Criteria**
*Please select and specify the inclusion and exclusion criteria for the entire study.*

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Prior cataract surgery
- Inclusion
- Exclusion

Prior glaucoma surgery
- Inclusion
- Exclusion

Prior glaucoma laser
- Inclusion
- Exclusion

Submit Form and go to Step to Next

Study Population Characteristics

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| Age |       |       |       |             |
| Mean age |     |       |       |             |
| Median age |   |       |       |             |

| Sex |       |       |       |             |
| Male |       |       |       |             |
| Female |     |       |       |             |

| Caucasian/White |       |       |       |             |
| n |       |       |       |             |

| African American/Black |       |       |       |             |
| n |       |       |       |             |

| Asian |       |       |       |             |
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### Baseline Parameter Characteristics

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Fill out only for diurnal curve studies

How long after baseline were the measurement(s) taken?

- Measurement 1
- Measurement 2

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B-11
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**Medication Information**

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**Timing:**
- □ Once a day
- □ Twice a day
- □ 3 times a day
- □ 4 times a day
- □ Other (specify)

**Specify other drug (if applicable):**
- □ Other (specify)
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### Surgical Intervention (check all that apply)

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### FOR LASER TRABECAULOPLASTY

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FOR TRABECULECTOMY

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FOR OTHER PROCEDURES

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DATA ABSTRACTION FOR OUTCOMES

INSTRUCTIONS:
- If there are no data for a particular outcome please check "Not reported." Do NOT leave a section blank to indicate the information was not reported.
- When there is information reported for both "N patients" and "N eyes," for a given outcome record ONLY the N that was used as the denominator to calculate the outcome, NOT both patients and eyes.
- If there is a discrepancy in sample sizes across outcomes within the same category (e.g., N for Mean IOP differs from N for Mean number of media) please note this discrepancy in the COMMENTS box at the bottom of the form.
- Enter standard error (SE) data ONLY when standard deviation (SD) is not available.
- If data are reported both with and without medication, capture data WITH medication.
- If a study reports more than one level or type of worsening of visual field, visual acuity or nerve damage report all categories of decline together within that outcome and time period.
- If a MEDICAL study reports data for both 3 and 6 months abstract ONLY the 3 month data.
- Do NOT abstract outcomes measured less than one year after SURGERY.

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**Visual fields 10-10 months**

- **Number of patients OR**
- **Number of eyes**
- **Clear Response**

**Not reported?**

- Yes

**Mean deviation**

- Mean
- SD
- SE
- Median

**Change in mean deviation**

- Mean improvement
- SD of improvement
- SE of improvement
- Mean decline
- SD of decline
- SE of decline
### Visual fields reported at greater than 18 months?
- Do NOT check this box if there was "last follow-up" data only
- Yes

### Visual acuity 1 month
- Number of patients OR
- Number of eyes
- Clear Response
- Not reported?
- Yes
- Visual acuity reported as:
  - LogMAR score OR
  - Snellen decimal
  - Clear Response

### Visual acuity
- Mean
- SD
- SE
- Median

### Change in visual acuity
- Mean improvement
- SD of improvement
- SE of improvement
- Mean decline
- SD of decline
- SE of decline

### Visual acuity decline
- Definition of decline in visual acuity
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<td>Nerve damage reported at greater than 18 months? Yes</td>
<td>Nerve damage reported at greater than 18 months? Yes</td>
<td>Nerve damage reported at greater than 18 months? Yes</td>
<td>Nerve damage reported at greater than 18 months? Yes</td>
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**Visual Impairment**

*Definition of visual impairment:*

**Levels of Visual Impairment:**

**Best Corrected Visual Acuity and/or Visual Field:**
- **MODERATE VISUAL IMPAIRMENT:** 20/200 20/250 20/300 20/400 (20/500 to 20/100)
- **SEVERE VISUAL IMPAIRMENT:** 20/500 20/1000 20/2000 (20/500 to 20/100)
- **PROFOUND VISUAL IMPAIRMENT:**
  - OR Visual field of 20 degrees or less
  - OR Visual field of 10 degrees or less

**Not reported?** Yes

**When was visual impairment reported?**
- Not reported
- At 1 month
- At 2-6 months
- At 6-12 months
- Greater than 12 months

---

**Primary outcomes not reported above:**

---

**COMMENTS:**
**Statistical Analysis Results**

**INSTRUCTIONS**
- Fill out one **ROW** for EACH time period of EACH comparison of EACH outcome for EACH statistic reported. Fill multiple forms if necessary.
- Capture BOTH comparisons within arms (e.g., baseline to 10-16 months mean IOP where both Comparators A and B are Arm 1) and comparisons between arms (e.g., baseline to 10-16 months mean IOP in Arm 1 vs. Arm 2).
- Capture statistical significance values even if refDSS have "Not applicable/not reported" point estimates.
- Confidence intervals (CI) should be reported as a range (e.g., "1.2 to 3.4")
- If both the CI and p value are reported, please capture CI only.

Tests for statistical significance will not be captured but may include: Chi-square, Fisher's exact test, T-test (paired, unpaired), ANOVA, ANCOVA, Mann Whitney U (Wilcoxon rank sum), Log rank test.

**OUTCOMES TO BE CAPTURED ARE:**
- Mean IOP
- Proportion of eyes with 20% or greater IOP reduction
- Proportion eyes with less than or equal to 14mm Hg
- Mean number of medications
- Mean visual acuity (LogMAR score or Snellen decimals)
- Proportion with progression by visual field
- Mean mean deviation

<table>
<thead>
<tr>
<th>COMPARATOR A</th>
<th>COMPARATOR B</th>
<th>TIME PERIOD</th>
<th>OUTCOME</th>
<th>POINT ESTIMATE</th>
<th>STATISTICAL SIGNIFICANCE VALUE</th>
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</table>

Variables included in any regression analyses as confounders:

*Please note if the analyses were adjusted for age, gender, severity, etc.*

Submit Form and go to next or skip to next.
Ref: 12. Skateboards: Are they really perilous? A retrospective study from a district hospital.
Yethnam U, Yenupalan RS, Sinha K.

For what arm of the study were harms reported? (select and define arm)

Please fill one form per arm of the study which reported harms:

- Arm 1
- Arm 2
- Arm 3
- Arm 4
- Entire study

Please enter the numbers of events, people and eyes (p), the denominator assessed for each arm (N) and the time after treatment they were reported:

- For medical treatments "early" results should be considered 1 month and "late" should be 3 months
- For surgical treatments "early" results should be considered 3 months and "late" should be 1 year

Harms
Eye irritation
- n people
- n Events

- 1mo
- 3mo
- 1yr
- Unspecified
Skin discoloration
- n people
- n Events
- n Eyes
- Denominator assessed for this adverse event (N)

Conjunctival injection
- n people
- n Events
- n Eyes
- Denominator assessed for this adverse event (N)

Iris color change
- n people
- n Events
- n Eyes
- Denominator assessed for this adverse event (N)

Punctal stenosis
- n people
- n Events
- n Eyes
- Denominator assessed for this adverse event (N)
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<th>Condition</th>
<th>n people</th>
<th>n Events</th>
<th>n Eyes</th>
<th>Denominator assessed for this adverse event (N)</th>
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<tr>
<td>Conjunctival shortening</td>
<td></td>
<td></td>
<td></td>
<td>□ 1 mo □ 3 mo □ 1 yr □ Unspecified</td>
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<tr>
<td>Peripheral anterior synchiae</td>
<td></td>
<td></td>
<td></td>
<td>□ 1 mo □ 3 mo □ 1 yr □ Unspecified</td>
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<tr>
<td>Systemic allergic reaction</td>
<td></td>
<td></td>
<td></td>
<td>□ 1 mo □ 3 mo □ 1 yr □ Unspecified</td>
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<tr>
<td>Loss of eye</td>
<td></td>
<td></td>
<td></td>
<td>□ 1 mo □ 3 mo □ 1 yr □ Unspecified</td>
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<tr>
<td>Need for additional surgery as a result of complications</td>
<td></td>
<td></td>
<td></td>
<td>□ 1 mo □ 3 mo □ 1 yr</td>
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</tbody>
</table>
Denominator assessed for this adverse event (N) __________________

Submit Form and go to or Skip
Quality form for RCTs

Sequence Generation

1. Was the allocation sequence adequately generated?
   - Low risk of bias
   - High risk of bias
   - Unclear/not reported

Clear Response

Criteria for a judgment of "YES" (i.e., low risk of bias)

- The investigators describe a random component in the sequence generation process such as:
  - Referring to a random number table. Using a computer random number generator. Coin tossing. Shuffling cards or envelopes. Throwing dice.
  - Drawing of lots. Minimization. Minimization may be implemented without a random element, and this is considered to be equivalent to being random.

Criteria for a judgment of "NO" (i.e., high risk of bias)

- The investigators describe a non-random component in the sequence generation process. Usually, the description would involve some systematic, non-random approach, for example:
  - Sequence generated by odd or even date of birth.
  - Sequence generated by some rule based on date (or day) of admission.
  - Sequence generated by some rule based on hospital or clinic record number.

- Other non-random approached happen much less frequently than the systematic approaches mentioned above and tend to be obvious. They usually involve judgment or some method of non-random categorization of participants, for example:
  - Allocation by judgment of the clinician.
  - Allocation by preference of the participant.
  - Allocation based on the results of a laboratory test or a series of tests.

Criteria for a judgment of "UNCLEAR" (i.e., uncertain risk of bias)

- Insufficient information about the sequence generation process to permit judgement of "YES" or "NO".
Allocation Concealment

2. Was allocation adequately concealed?
   ○ Low risk of bias
   ○ High risk of bias
   ○ Unclear/not reported
   Clear Response

Criteria for a judgment of “YES” (i.e. low risk of bias)
   - Participants and investigators enrolling participants could not foresee assignment because one of the following, or an equivalent method, was used to conceal allocation:
     - Central allocation (including telephone, web-based, and pharmacy-controlled randomization).
     - Sequentially numbered drug containers of identical appearance.
     - Sequentially numbered, opaque, sealed envelopes.

Criteria for a judgment of “NO” (i.e. high risk of bias)
   - Participants or investigators enrolling participants could possibly foresee assignments and thus introduce selection bias, such as allocation based on:
     - Using an open random allocation schedule (e.g. a list of random numbers).
     - Assignment envelopes were used without appropriate safeguards (e.g., if envelopes were unsealed or non-opaque or not sequentially numbered).
     - Alternation or rotation.
     - Date of birth.
     - Case record number.
     - Any other explicitly unconcealed procedure.

Criteria for the judgment of “UNCLEAR” (i.e. uncertain risk of bias)
   - Insufficient information about the sequence generation process to permit judgment of “YES” or “NO”.
     - This is usually the case if the method of concealment is not described or not described in sufficient detail to allow a definite judgment – for example if the use of assignment envelopes is described, but it remains unclear whether envelopes were sequentially numbered, opaque and sealed.

Blinding of Participants, Personnel, and Outcome Assessors

3. Was knowledge of the allocated interventions adequately prevented during the study?
   ○ Low risk of bias
   ○ High risk of bias
   ○ Unclear/not reported
   Clear Response

Criteria for a judgment of “YES” (i.e. low risk of bias)
   - Any one of the following:
- No blinding, but the review authors judge that the outcomes.
- Blinding of participants and key study personnel ensured, but unlikely that the blinding could have been broken.
- Either participants or some key study personnel were not blinded, but outcome assessment was blinded and the non-blinding of others unlikely to introduce bias.

Criteria for a judgment of 'NO' (i.e. high risk of bias)
- Any one of the following:
  - No blinding or incomplete blinding, and the outcome or outcome measurement is likely to be influenced by lack of blinding;
  - Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken;
  - Either participants or some key study personnel were not blinded, and the non-blinding of others likely to introduce bias.

Criteria for the judgment of 'UNCLEAR' (i.e. uncertain risk of bias)
- Any one of the following:
  - Insufficient information to permit judgment of 'Yes' or 'No';
  - The study did not address this outcome.

Incomplete Outcome Data

4. Were incomplete outcome data adequately addressed?
- Low risk of bias
- High risk of bias
- Unclear/Not reported
- Clear Response

Criteria for a judgment of 'YES' (i.e. low risk of bias)
- Any one of the following:
  - No missing outcome data;
  - Reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias);
  - Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups;
  - For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate;
  - For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size;
  - Missing data have been imputed using appropriate methods.

Criteria for a judgment of 'NO' (i.e. high risk of bias)
- Any one of the following:
  - Reason for missing outcome data likely to be related to true outcome, with either imbalance in numbers or reasons for missing data across intervention groups;
  - For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate;
  - For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size;
  - 'As-treated' analysis done with substantial departure of the intervention received from that assigned at randomization.
- Potentially inappropriate application of simple imputation

Criteria for the judgment of "UNCLEAR" (i.e., uncertain risk of bias)
- Any one of the following:
  - Insufficient reporting of attrition/exclusions to permit judgment of 'Yes' or 'No' (e.g., number randomized not stated, no reasons for missing data provided);
  - The study did not address this outcome.

Other Potential Threats to Validity

5. Was the study apparently free of other problems that could put it at a risk of bias?

- Low risk of bias
- High risk of bias
- Unclear/not reported

Clear Response

Criteria for a judgment of "YES" (i.e., low risk of bias)
- The study appears to be free of other sources of bias.

Criteria for a judgment of "NO" (i.e., high risk of bias)
- There is at least one important risk of bias. For example, the study:
  - Had a potential source of bias related to the specific study design used; or
  - Stopped early due to some data-dependent process (excluding a formal-stopping rule); or
  - Had extreme baseline imbalance; or
  - Has been claimed to have been fraudulent; or
  - Had some other problem.

Criteria for the judgment of "UNCLEAR" (i.e., uncertain risk of bias)
- There may be a risk of bias, but there is either:
  - Insufficient information to assess whether an important risk of bias exists; or
  - Insufficient rationale or evidence that an identified problem will introduce bias.

Pharmaceutical Support

6. Did this study receive support (research funds, medications provided, writing services, author or staff was employee) from a company having a financial interest in any of the medications studied?

- Low risk of bias
- High risk of bias
- Unable to determine/not reported

Clear Response

7. If "Yes," did the company have any involvement in the design, conduct, or reporting of the study?

For "NO," the authors are not employees of the company and the authors had complete access to the data, and the company was not involved in the design, conduct, analysis, or reporting of the study.
Overall Quality of Study

8. Please rate the overall quality of the study:

- GOOD
- FAIR
- POOR

Criteria for a judgment of "GOOD" (i.e., low risk of bias)

- These studies have the least bias and results are considered valid
- A study that adheres mostly to the commonly held concepts of high quality including the following:
  - A formal randomized controlled study;
  - Clear description of the population, setting, interventions, and comparison groups;
  - Appropriate measurements of outcomes;
  - Appropriate statistical and analytic methods and reporting;
  - No reporting errors;
  - Low dropout rate; and
  - Clear reporting of dropouts

Criteria for a judgment of "FAIR"

- These studies are susceptible to some bias, but it is not sufficient to invalidate the results.
- Do not meet all the criteria required for a rating of good quality because they have some deficiencies, but no flaw is likely to cause major bias.
- The study may be missing information, making it difficult to assess limitations and potential problems

Criteria for a judgment of "POOR" (i.e., high risk of bias)

- These studies have significant flaws that imply biases of various types that may invalidate the results.
- Have serious errors in design, analysis, or reporting; large amounts of missing information; or discrepancies in reporting.

9. Were >20% of the study participants lost to followup at any of the following time points?

- First reported time point (weeks)
- 12-16 weeks
- 48-54 weeks
- Last pre-specified time point (weeks)
- Not Reported
- No
10. Please add comments below.
Quality Form for Observational Studies

Reporting

1. Are the main outcomes to be measured clearly described in the Introduction or Methods section?
   If the main outcomes are both identified and defined, then the answer is “YES”. If the main outcomes are first mentioned in the Results section, the question should be answered “NO”.
   - YES
   - NO
   - UNABLE TO DETERMINE/ NOT REPORTED
   Clear Response

2. Are the characteristics of the patients included in the study clearly described?
   In cohort studies and trials, inclusion and/or exclusion criteria should be given. In case-control studies, a case-definition and the source for controls should be given.
   - YES
   - NO
   - UNABLE TO DETERMINE/ NOT REPORTED
   Clear Response

3. Are the interventions of interest clearly described?
   Treatments and placebo (where relevant) that are to be compared should be identified and defined.
   - YES
   - NO
   - UNABLE TO DETERMINE/ NOT REPORTED
4. Are the distributions of principal confounders in each group of subjects to be compared clearly described?

The confounders should be 1) identified and 2) defined along with 3) distribution in each group. A list of principal confounders is provided in text (identification) with definitions of each confounder. Table 1 and/or the first paragraph of the Results usually provide the distribution of potential confounders by treatment/case status.

☐ YES
☐ NO
☐ UNABLE TO DETERMINE/ NOT REPORTED

Clear Response

Selection Bias

5. Were the patients in different intervention groups (cohort studies) or were the cases and controls (case-control studies) recruited from the same population?

The patients in each group should be 1) from the same source population, 2) with the same inclusion/exclusion criteria applied (other than exposure/case status), 3) recruited over the same period of time.

For a study which does not specify the time period over which patients were recruited, the question should be answered as unable to determine.

☐ YES
☐ NO
☐ UNABLE TO DETERMINE/ NOT REPORTED
☐ N/A

Clear Response

6. Were losses of patients to follow-up taken into account?

Methods to account for losses to follow-up include calculating the incidence rate directly or using a survival/life table method. If the numbers of patients lost to follow-up are not reported, the question should be answered as unable to determine. If the proportion lost to follow-up was less than 20% in each arm at the end of the study, the question should be answered "YES":

☐ YES
☐ NO
☐ UNABLE TO DETERMINE/ NOT REPORTED
☐ N/A

Clear Response

Confounding

7. Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?
stratified by the demonstrated confounders of interest, the answer is "YES".
If the effect of the main confounders was not investigated or confounding was demonstrated (different distribution of potential confounders by exposure/exposure group) but no adjustment was made in the final analyses the question should be answered as "NO".
If the study was a matched case-control study and the method of analysis was not conditional logistic regression, the answer is "NO".

- YES
- NO
- UNABLE TO DETERMINE/ NOT REPORTED

**Overall Quality of Study**

8. Please rate the overall quality of the study using the reporting, selection bias and confounding domains:

- Good indicates all "YES" responses
- Fair indicates mostly "YES" for Reporting and all "YES" for Selection Bias and Confounding bias. Poor indicates at least 1 "NO" or "Unable to determine" for selection or confounding bias.

- GOOD
- FAIR
- POOR

**Conflict of Interest**

9. Did this study receive support (research funds, medications provided, writing services, author or staff was employee) from a company having a financial interest in any of the medications studied?

- YES
- NO
- UNABLE TO DETERMINE/ NOT REPORTED

10. If above question is answered yes: did the company have any involvement in the design, conduct, or reporting of the study?

For "NO", the authors are not employees of the company and the authors had complete access to the data, and the company was not involved in the design, conduct, analysis, or reporting of the study.

- YES
- NO
- UNABLE TO DETERMINE/ NOT REPORTED

11. Please add any comments below

B-60
### Appendix C. Evidence Tables

#### Evidence Table 1. Systematic review evidence I

<table>
<thead>
<tr>
<th>Study</th>
<th>KQs</th>
<th>Aims of the study</th>
<th>Conclusions</th>
<th>Types of participants</th>
<th>Types of interventions</th>
</tr>
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<tbody>
<tr>
<td>Aptel 2008&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3,6</td>
<td>“This systematic meta-analysis was performed to evaluate the intraocular pressure (IOP) lowering effects and tolerability of latanoprost, bimatoprost, and travoprost.”</td>
<td>“The findings suggest a greater efficacy of bimatoprost compared with latanoprost and travoprost, although the incidence of hyperemia was lower with the latter 2 agents.”</td>
<td>Y Y N N</td>
<td>POAG or OHT in at least 90% of trial participants Latanoprost, travoprost, or brimatoprost monotherapy</td>
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<td>Burr 2004&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1,2,3,4,6</td>
<td>“To study the relative efficacy of medical and surgical treatment for OAG in terms of measures of glaucoma progression and adverse effects of treatment.”</td>
<td>“Evidence from one trial suggests, for mild OAG, that VF deterioration up to five-years is not significantly different whether treatment is initiated with medication or trabeculectomy. Reduced vision, cataract and eye discomfort are more likely with trabeculectomy. There is some evidence, for more severe OAG, that initial medication (pilocarpine, now rarely used as first line medication) is associated with greater VF deterioration than surgery. In general, surgery lowers IOP more than medication.”</td>
<td>Y N N N</td>
<td>IOP lowering meds compared with trabeculectomy w/ or w/o use of anti-scarring agents; non-penetrating trabeculectomy w/ or w/o use of anti-scarring agents; any other antiglaucomatous surgery</td>
</tr>
<tr>
<td>Chai 2010&lt;sup&gt;3&lt;/sup&gt;</td>
<td>3,6</td>
<td>Compare the efficacy and safety profile of viscocanalostomy</td>
<td>“Trabeculectomy was found to have a greater pressure lowering effect compared with viscocanalostomy. However, viscocanalostomy had a significantly better risk profile.”</td>
<td>NR NR NR NR</td>
<td>1.7% of participants with primary chronic angle closure glaucoma Viscocanalostomy versus trabeculectomy</td>
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<tr>
<td>Study</td>
<td>KQs</td>
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<td>Conclusions</td>
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<td>Cheng 2008</td>
<td>3,6</td>
<td>&quot;To evaluate the efficacy and tolerability of bimatoprost compared with latanoprost in reducing intraocular pressure.&quot;</td>
<td>&quot;Bimatoprost was associated with significantly greater efficacy in lowering morning IOP than latanoprost at all time points. Comparable proportions of patients reached the IOP target with bimatoprost and latanoprost. Both agents were well tolerated, although bimatoprost was associated with a significantly greater frequency of conjunctival hyperemia than latanoprost.&quot;</td>
<td>NR Y NR NR Glaucoma</td>
<td>Bimatoprost versus latanoprost</td>
</tr>
<tr>
<td>Cheng 2009</td>
<td>3,6</td>
<td>&quot;The aim of this study was to evaluate the efficacy and tolerability of latanoprost, compared with the combination of dorzolamide and timolol, in the treatment of patients with elevated intraocular pressure.&quot;</td>
<td>&quot;Latanoprost was associated with significantly greater efficacy in lowering diurnal mean IOP than combined dorzolamide and timolol in patients with IOP insufficiently controlled by timolol alone, and latanoprost was as effective as combined dorzolamide and timolol in patients without baseline timolol treatment. The combination of dorzolamide and timolol was less tolerated than latanoprost.&quot;</td>
<td>Y Y Y N Pigmentary, mixed glaucoma as well as 1 trial with chronic angle closure glaucoma participants</td>
<td>Latanoprost versus combined dorzolamine and timolol (concomitant administration or fixed combination)</td>
</tr>
<tr>
<td>Cheng 2010</td>
<td>3,6</td>
<td>&quot;To evaluate the efficacy and tolerability of nonpenetrating filtering surgery in the treatment of patients with open-angle glaucoma.&quot;</td>
<td>&quot;Viscocanalostomy and deep sclerectomy were less effective than trabeculectomy in the treatment of open angle glaucoma, and deep sclerectomy plus mitomycin C (MMC) was also less effective than trabeculectomy plus MMC. However, viscocanalostomy and deep sclerectomy were associated with fewer complications than trabeculectomy.&quot;</td>
<td>Y N N N</td>
<td>Viscocanalostomy versus trabeculectomy with or without antimetabolite; deep sclerectomy versus trabeculectomy with or without mitomycin C</td>
</tr>
<tr>
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<tr>
<td>Cox 2008†</td>
<td>3,6</td>
<td>&quot;To evaluate the efficacy of the fixed combination ocular hypotensive therapies compared with their nonfixed components used concomitantly for lowering intraocular pressure in glaucoma and ocular hypertension.&quot;</td>
<td>&quot;Fixed combination therapies are equally safe and effective at lowering IOP as their non-fixed components administered concomitantly.&quot;</td>
<td>NR Y NR NR Glaucoma</td>
<td>Fixed combination medications compared with non-fixed components used (concomitant) (travoprost, brimonidine, dorzolamide, bimatoprost) and a beta blocker</td>
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<tr>
<td>Eyawo 2009*</td>
<td>3,6</td>
<td>&quot;To identify randomized trials evaluating the head-to-head effectiveness of prostaglandin analogs in the treatment of POAG and ocular hypertension and to conduct a meta-analysis of their results to improve understanding of the drugs’ relative efficacy.&quot;</td>
<td>&quot;Randomized head-to-head evaluations of prostaglandin therapy demonstrate similar efficacy effects, but differing hyperemia effects.&quot;</td>
<td>Y Y N N Other types of chronic open angle glaucoma</td>
<td>Travoprost versus latanoprost or bimatoprost; latanoprost versus bimatoprost</td>
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<tr>
<td>Fung 2007†</td>
<td>3,6</td>
<td>&quot;To compare the efficacy and tolerability of latanoprost versus brimonidine in the treatment of open angle glaucoma, ocular hypertension or normal-tension glaucoma.&quot;</td>
<td>&quot;Latanoprost is more effective than brimonidine as monotherapy in lowering IOP. Brimonidine is associated with a higher rate of fatigue.&quot;</td>
<td>Y Y N Y Mixed glaucoma</td>
<td>Latanoprost versus brimonidine</td>
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<tr>
<td>Hodge 2008†</td>
<td>3,6</td>
<td>&quot;To systematically review the literature on the efficacy and harm of prostaglandin analogues compared to brimonidine and dorzolamide in treating elevated intraocular pressure.&quot;</td>
<td>&quot;Latanoprost was found to be significantly superior to dorzolamide but not brimonidine. However, ocular adverse events were significantly fewer in latanoprost users than in brimonide users. Neither travoprost nor bimatoprost was compared to dorzolamide or brimonide in the present literature.&quot;</td>
<td>N Y N N Latanoprost versus dorzolamide and brimonidine</td>
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<td>Study</td>
<td>KQs</td>
<td>Aims of the study</td>
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<td>Honrubia 2009</td>
<td>6</td>
<td>&quot;To conduct a meta-analysis of randomised clinical trials to evaluate the development of conjunctival hyperaemia after the use of latanoprost versus travoprost and bimatoprost, in patients with ocular hypertension or glaucoma.&quot;</td>
<td>&quot;According to available data, the use of latanoprost is associated with a lower incidence of conjunctival hyperaemia when compared with travoprost and bimatoprost in the treatment of patients with ocular hypertension or glaucoma.&quot;</td>
<td>NR Y NR NR Glaucoma</td>
<td>Latanoprost versus travoprost and bimatoprost</td>
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<tr>
<td>Jampel 2003</td>
<td>3,4,6</td>
<td>&quot;The objectives of this evidence report were to: identify the most important questions pertinent to treatment of patients with coexisting cataract and glaucoma; assess the published literature with respect to quality and content regarding these questions; and to inform clinical practitioners and identify areas where future research is needed, based on the literature findings&quot;</td>
<td>&quot;The literature does not point to one optimal strategy for controlling IOP in patients with coexisting cataract and glaucoma needing surgery. Therefore, there is a continued need for high quality studies with greater duration and more information on optic nerve and visual field findings.&quot;</td>
<td>Y N Y N OAG or ACG with coexisting cataract</td>
<td>Laser treatment, filtration surgery, endoscopic cyclophotocoagulation, nonpenetrating surgeries. Clear corneal and scleral cataract incision and nuclear expression/phacoemulsification</td>
</tr>
<tr>
<td>Kirwan 2009</td>
<td>3,6</td>
<td>&quot;To assess the effectiveness of beta radiation during glaucoma surgery (trabeculectomy).&quot;</td>
<td>&quot;Trabeculectomy with beta irradiation has a lower risk of surgical failure compared to trabeculectomy alone. A trial of beta irradiation versus anti-metabolite is warranted.&quot;</td>
<td>Y Y Y Y 1st surgical procedure; no simultaneous bilateral surgery; all types of glaucoma included in review inclusion criteria, but included studies enrolled participants with OAG</td>
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<tr>
<td>Study</td>
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<td>Li 2006&lt;sup&gt;14&lt;/sup&gt;</td>
<td>3,6</td>
<td>&quot;To evaluate the incidence of reported side-effects and intraocular pressure-lowering effect of travoprost versus other prostaglandin analogues (latanaprost, bimatoprost, unoprostone) or timolol.&quot;</td>
<td>&quot;Travoprost is more effective than timolol in lowering IOP in patients with openangle glaucoma or ocular hypertension. Compared with other prostaglandin analogues, travoprost appears to be equivalent to bimatoprost and latanoprost. Although a limited number of local side-effects were reported, no serious treatment-related side-effects were reported.&quot;</td>
<td>Y        Y        N        N</td>
<td>Travoprost compared with other prostaglandin analogs or timolol</td>
</tr>
<tr>
<td>Liu 2010&lt;sup&gt;23&lt;/sup&gt;</td>
<td>1,3,6</td>
<td>&quot;This meta-analysis evaluated the efficacy and tolerability of one-site versus two-site phacotrabeculectomy in the treatment of patients with coexisting cataract and glaucoma.&quot;</td>
<td>&quot;Two-site phacotrabeculectomy is superior to one-site phacotrabeculectomy in reducing IOP, but other post-operative effects are similar. One-site and two-site phacotrabeculectomies have similar adverse event rates.&quot;</td>
<td>NR       NR       NR       NR</td>
<td>Phacotrabeculectomy (1 site versus 2 site)</td>
</tr>
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<td>Loon 2008&lt;sup&gt;16&lt;/sup&gt;</td>
<td>3,6</td>
<td>&quot;To compare the efficacy and tolerability of timolol versus brimonidine in the treatment of glaucoma.&quot;</td>
<td>&quot;Both drugs are effective in lowering IOP. Brimonidine is associated with a higher rate of allergy.&quot;</td>
<td>Y        Y        NR       NR</td>
<td>Other glaucoma (2%)</td>
</tr>
<tr>
<td>Maier 2005&lt;sup&gt;17&lt;/sup&gt;</td>
<td>4</td>
<td>&quot;To summarize the evidence of the effectiveness of intraocular pressure lowering treatment to 1) delay OAG among those with OHT ocular hypertension 2) delay progression of OAG&quot;</td>
<td>&quot;Lowering intraocular pressure in patients with ocular hypertension or manifest glaucoma is beneficial in reducing the risk of visual field loss in the long term.&quot;</td>
<td>Y        Y        N        Y</td>
<td>Medical and/or surgical treatment (timolol, betaxolol, various medications, laser trabecuoplasty, betaxolol, and latanoprost versus concurrent untreated control group (Includes OHTS, EMGT, CNGTS)</td>
</tr>
<tr>
<td>Minckler 2006&lt;sup&gt;11&lt;/sup&gt;</td>
<td>1,3,6</td>
<td>&quot;This review compares aqueous shunts for IOP control and safety.&quot;</td>
<td>&quot;Relatively few randomized trials have been published on aqueous shunts and methodology and data quality among them is poor. To date there is no evidence of superiority of one shunt over another.&quot;</td>
<td>Y        NR       Y        NR</td>
<td>Aqueous shunts versus standard surgery or cyclodestruction</td>
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<tr>
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<td>Rolim de Moura 2007</td>
<td>2,3,4,6</td>
<td>&quot;To study the effects of laser trabeculoplasty for OAG&quot;</td>
<td>&quot;Evidence suggests that, in people with newly diagnosed OAG, the risk of uncontrolled IOP is higher in people treated with medication used before the 1990s when compared to laser trabeculoplasty at two years followup. Trabeculoplasty is less effective than trabeculectomy in controlling IOP at six months and two years follow up. Different laser technology and protocol modalities were compared to the traditional laser trabeculoplasty and more evidence is necessary to determine if they are equivalent or not. There is no evidence to determine the effectiveness of laser trabeculoplasty compared to contemporary medication (prostaglandin analogues, topical anhydrase inhibitors and alpha2-agonists) and also with contemporary surgical techniques.&quot;</td>
<td>Y N N N</td>
<td>Argon laser trabeculoplasty versus medication, trabeculectomy, diode laser trabeculoplasty or ND: Yag laser; Laser trabeculoplasty, betaxolol, and latanoprost versus observation for POAG or NTG (Includes EMGT)</td>
</tr>
<tr>
<td>Vass 2007</td>
<td>4,6</td>
<td>&quot;To assess and compare the effectiveness of topical</td>
<td>&quot;The results of this review support the current practice of IOP&quot;</td>
<td>Y Y N N</td>
<td>Topical medications versus placebo or untreated control</td>
</tr>
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<td>pharmacological treatment for POAG or OHT to prevent progression or onset of glaucomatous optic neuropathy.&quot;</td>
<td>lowering treatment of OHT. A visual field protective effect has been clearly demonstrated for medical IOP lowering treatment. Positive but weak evidence for a beneficial effect of the class of beta-blockers has been shown. Direct comparisons of prostaglandins or brimonidine to placebo are not available and the comparison of dorzolamide to placebo failed to demonstrate a protective effect. However, absence of data or failure to prove effectiveness should not be interpreted as proof of absence of any effect. The decision to treat a patient or not, as well as the decision regarding the drug with which to start treatment, should remain individualised, taking in to account the amount of damage, the level of IOP, age and other patient characteristics.&quot;</td>
<td>OAG</td>
<td>OH T ACG NTG Other</td>
</tr>
<tr>
<td>Wilkins 200521</td>
<td>3,6</td>
<td>&quot;To assess the effects of intraoperative mitomycin C compared to placebo in trabeculectomy.&quot;</td>
<td>&quot;Intraoperative mitomycin C reduces the risk of surgical failure in eyes that have undergone no previous surgery and in eyes at high risk of failure. Compared to placebo it reduces mean IOP at 12 months in all groups of participants in this review. Apart from an increase in cataract formation following MMC, there was insufficient power to detect any increase in other serious side effects such as endophthalmitis.&quot;</td>
<td>NR</td>
<td>NR NR NR NR</td>
</tr>
<tr>
<td>Wormald 200122</td>
<td>3,6</td>
<td>&quot;To assess the effects of postoperative injections of 5-FU in eyes of people</td>
<td>&quot;Postoperative injections of 5-FU are now rarely used as a planned series but are increasingly used on People undergoing glaucoma surgery (high risk of Post-operative injection of 5-FU (any dose) versus placebo or no injection</td>
<td>NR</td>
<td>NR NR NR NR</td>
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<tr>
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<td>undergoing surgery for glaucoma.&quot;</td>
<td>an ad hoc basis. This presumably reflects an aspect of the treatment that is unacceptable to both patients and doctors. None of the trials reported on the participants’ perspective of care which constitutes a serious omission for an invasive treatment such as this.&quot;</td>
<td>N</td>
<td>failure, combined glaucoma and cataract surgery, and primary trabeculectomy; At least one included study enrolled participants with ACG</td>
</tr>
<tr>
<td>Zhang 200123</td>
<td>3,6</td>
<td>&quot;To evaluate the comparative efficacy and tolerance of latanoprost versus timolol through a meta-analysis of randomised controlled trials.&quot;</td>
<td>&quot;This meta-analysis suggests that latanoprost is more effective than timolol in lowering IOP. However, it often causes iris pigmentation. While current evidence suggests that this pigmentation is benign, careful lifetime evaluation of patients is still justified.&quot;</td>
<td>Y Y N N</td>
<td>Latanoprost versus timolol</td>
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## Evidence Table 2. Systematic review evidence II

<table>
<thead>
<tr>
<th>Study</th>
<th>Types of studies included</th>
<th>Summary Outcomes</th>
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<tbody>
<tr>
<td>Aptel 2008⁵</td>
<td>RCT</td>
<td>Bimatoprost versus Latanoprost (5 trials) IOP reduction from baseline to 3 months (range 1 to 6 months)</td>
</tr>
<tr>
<td></td>
<td>Quasi RCT</td>
<td>8 AM: WMD, 0.50; 95% CI, 0.01 to 0.99 12PM: WMD, 1.17; 95% CI, 0.68 to 1.66 4 PM: WMD, 0.78; 95% CI, 0.26 to 1.29 8 PM: WMD, 0.67; 95% CI, 0.02 to 1.32</td>
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<tr>
<td></td>
<td>Obs</td>
<td>Bimatoprost versus Travoprost (3 trials) IOP reduction from baseline to 3 months (range 1 to 6 months)</td>
</tr>
<tr>
<td></td>
<td>Visual impairment</td>
<td>8 AM: WMD, 1.02; 95% CI, 0.32 to 1.72 12 PM: WMD, 0.86; 95% CI, 0.12 to 1.59 4 PM: WMD, 0.52; 95% CI, -0.25 to 1.30 8 PM: WMD, 0.80; 95% CI, -0.06 to 1.66</td>
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<tr>
<td></td>
<td>Patient Reported</td>
<td>Travoprost versus Latanoprost (2 trials) IOP reduction from baseline to 3 months (range 1 to 6 months)</td>
</tr>
<tr>
<td></td>
<td>IOP</td>
<td>8 AM: WMD, 0.70; 95% CI, -0.14 to 1.54 12 PM: WMD, 0.40; 95% CI, -0.49 to 1.29 4 PM: WMD, -0.10; 95% CI, -0.98 to 0.78 8 PM: WMD, 0.20; 95% CI, -0.71 to 1.11</td>
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<td></td>
<td>Visual field progression</td>
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<td>Optic nerve damage</td>
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<td>Harms</td>
<td>Bimatoprost versus Latanoprost Conjuctival hyperemia (5 trials): RR, 1.70; 95% CI 1.44 to 2.02 Bimatoprost versus Travoprost Conjuctival hyperemia (3 trials): RR, 1.19; 95% CI, 1.00 to 1.42 Travoprost versus Latanoprost Conjuctival hyperemia (2 trials): RR,1.45; 95% CI, 1.22 to 1.72</td>
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<tr>
<td>Study</td>
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</table>
| Burr 2004 | Y Y N | **Initial medical treatment versus initial trabeculectomy**  
Visual acuity loss of 2 or more Snellen lines  
OR 1.48; 95% CI, 0.58 to 3.81 (1 study)  
OR 0.5; 95% CI, 0.33 to 0.75 (1 study)  
Covered with primary study discussion (KQ 2)  
Initial medical treatment versus initial trabeculectomy  
Mean change in IOP at 1 year (2 trials):  
WMD, 6.14; 95% CI, 4.25 to 8.02  
Mean IOP difference from baseline to 1 year (1 trial):  
MD, 3.60; 95% CI, 2.78 to 4.42  
Visual field progression by at least one stage of visual field severity at a mean of 4.6 years follow-up (1 trial):  
OR, 2.56; 95% CI, 1.12 to 5.83  
Mean difference in visual field score at 5 year follow-up  
MD, 3.92; 95% CI, 2.02 to 5.82 (1 trial)  
MD, 0.30; 95% CI, -0.45 to 1.05 (1 trial)  
Visual field progression at 5 year follow-up (1 trial):  
OR, 0.69; 95% CI, 0.29 to 1.67 | Initial medical treatment versus initial trabeculectomy  
Argon laser trabeculoplasty required as additional treatment at 1 year follow-up (1 trial):  
OR, 2.36; 95% CI, 1.52 to 3.67 | Initial medical treatment versus initial trabeculectomy  
Optic nerve damage | Harms |
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<td>Visual impairment</td>
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<td>RCT</td>
<td>Quasi RCT</td>
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| Chai 2010 | Y                         | N | N | NR |                                                                 |                                                                                                                                                                                                 |}

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<td></td>
<td>RCT</td>
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<tr>
<td>Cheng 2008</td>
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<tr>
<td>Cheng 2009&lt;sup&gt;5&lt;/sup&gt;</td>
<td>RCT Quasi RCT Obs</td>
<td>Latanoprost versus Dorzolamide and Timolol (fixed combination and concomitant administration)</td>
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<td>Diurnal mean percent reduction in IOP 1 month (5 trials): WMD, -3.22; 95% CI, –6.85 to 0.40</td>
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<td>2 months (5 trials): WMD, –1.88; 95% CI, –4.71 to 0.96</td>
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<td>3 months (6 trials): WMD, 0.57; 95% CI, –2.46 to 3.59</td>
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<td>6 months (2 trials): WMD, –5.14; 95% CI, –14.13 to 4.14</td>
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<td>Mean percent reduction in IOP at 10:00 1 month (6 trials): WMD, –2.47; 95% CI, –5.20 to 0.26</td>
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<td>2 months (4 trials): WMD, 0.19; 95% CI, –4.81 to 5.19</td>
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<td>3 months (5 trials): WMD, 1.03; 95% CI, –1.79 to 3.84</td>
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<td>6 months (2 trials): WMD, –1.47; 95% CI–4.00 to 1.05</td>
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<td>Ocular adverse events (3 trials): RR, 0.96; 95% CI, 0.21 to 4.46</td>
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<td>Conjunctival hyperemia (8 trials): RR, 2.38; 95% CI, 1.47 to 3.83</td>
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<td>Taste perversion (8 trials): RR, 0.11; 95% CI, 0.04 to 0.26</td>
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<td>Keratitis (4 trials): RR, 0.80; 95% CI, 0.43 to 1.79</td>
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<td>Iris pigmentation (3 trials): RR, 8.11; 95% CI, 1.47 to 44.75</td>
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<td>Dry eye (4 trials): RR, 0.96; 95% CI, 0.27 to 3.43</td>
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<td>Visual disturbance (6 trials): RR, 1.22; 95% CI, 0.53 to 2.82</td>
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<td></td>
<td>RCT Quasi RCT Obs</td>
<td>Visual impairment</td>
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<td>Cheng 2010&lt;sup&gt;6&lt;/sup&gt;</td>
<td>Y N N NR</td>
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<td>Cox 2008</td>
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<td>Eyawo 2009</td>
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<tr>
<td>Hodge 2008[1]</td>
<td>Y Y</td>
<td>Latanoprost versus Brimonidine</td>
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<tr>
<td></td>
<td>N NR</td>
<td>Mean IOP reduction from baseline to &lt; 6 months (10 trials): WMD, 0.76; 95% CI, 0.12 to 1.39</td>
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<tr>
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<td>Mean IOP reduction from baseline to &gt; 8 months (4 trials): WMD, 1.64; 95% CI, 0.92 to 2.36</td>
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<td>Cataract extraction combined with trabeculectomy with MMC versus with Placebo or no treatment. Mean IOP at 12 months (3 trials): WMD, -3.34; 95% CI, -4.16 to -2.51. Primary trabeculectomy with MMC versus with Placebo or no treatment Mean IOP at 12 months (2 trials): WMD, -5.41; 95% CI, -7.34 to -3.49.</td>
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<td>Latanoprost versus timolol Conjunctival hyperemia (6 trials): RR, 2.20; 95% CI, 1.33 to 3.65 Conjunctivitis (3 trials): RR, 0.80; 95% CI, 0.25 to 2.53 Increased pigmentation (4 trials): RR, 8.01; 95% CI, 1.87 to 34.30</td>
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Abbreviations: Y = Yes; N = No; NR = Not reported; IOP = Intraocular pressure; OR = Odds ratio; MD = Mean difference, WMD = Weighted mean difference ; 95% CI = 95% confidence interval; RR = relative risk; RD = risk difference; RCT = Randomized controlled trial; Quasi RCT = Quasi randomized controlled trial; Obs = Observational study; PRO = Patient reported outcome
## Evidence Table 3. Risk of bias for RCTs

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<td>Baseline IOP &gt;21 OAG with borderline visual field damage</td>
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<td>narrow angle</td>
<td>Levbunolol 0.5% Untreated</td>
<td>12 pat/23 eyes 14 pat/26 eyes</td>
<td>57.5  64.79</td>
<td>23.65  24.15</td>
<td></td>
</tr>
<tr>
<td>Schuman 1997⁹²</td>
<td>US</td>
<td>NS</td>
<td>Baseline IOP 23-35 POAG</td>
<td>prior ocular surgery within last 6 months</td>
<td>Brimonidine Timolol 0.5%</td>
<td>186 pat 188 pat</td>
<td>NS</td>
<td>24.8  24.6</td>
<td></td>
</tr>
<tr>
<td>Tuulonen 1989⁹³</td>
<td>Europe</td>
<td>NS</td>
<td>IOP ≤22 Simple or capsular glaucoma</td>
<td>Prior ocular surgery or laser</td>
<td>Laser Medical</td>
<td>Pat/eyes 19/19 20/20</td>
<td>69.6  68.1</td>
<td>29.4  28.3</td>
<td></td>
</tr>
<tr>
<td>Yamamoto 1996⁹⁷</td>
<td>Asia</td>
<td>NS</td>
<td>POAG</td>
<td>prior ocular surgery</td>
<td>Timolol 0.5% Carteolol 1% Carteolol 2%</td>
<td>12 pat 9 pat 12 pat</td>
<td>50.3  52.3</td>
<td>21.0  20.9  20.8</td>
<td></td>
</tr>
</tbody>
</table>

Evidence Table 4. KQ1 medical population characteristics
## Evidence Table 5. KQ 1 medical outcomes

<table>
<thead>
<tr>
<th>Study</th>
<th>Comparators</th>
<th>Visual Acuity at baseline</th>
<th>Visual Acuity at Follow-up/timepoint</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berson 1985²⁵</td>
<td>Levocabunolol 0.5%</td>
<td>Not reported</td>
<td>Not reported</td>
<td>57 patients similarly distributed among the groups, had reduction on 2 lines on VA at some point of the study, but it was transient and was considered unrelated to study treatments.</td>
</tr>
<tr>
<td></td>
<td>Levocabunolol 1% Timolol 0.5%</td>
<td></td>
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</tr>
<tr>
<td>Chiselita 2005³⁶</td>
<td>Latanoprost Travoprost Dorzolamide/Timolol</td>
<td>VA 0.89 ±0.19 (mean±SD)</td>
<td>VA 0.90 ± 0.20(mean±SD)</td>
<td>Results for all population. Time not specified (Follow up 3 months each phase)</td>
</tr>
<tr>
<td>Flammer 1992³⁹</td>
<td>Carteolol Timolol 0.5%</td>
<td>Mean ±SD</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VA 1.01 ± 0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VA 1.04 ± 0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marcon 1990⁵⁹</td>
<td>Betaxolol 0.5% Levocabunolol</td>
<td>Not reported</td>
<td>Not reported</td>
<td>VA unchanged during the study</td>
</tr>
<tr>
<td>Prata 2009⁹⁹</td>
<td>Timolol 0.5% Brimonidine Travoprost</td>
<td>BCVA logMAR score 0.18 / VAS 6.8</td>
<td>BCVA logMAR score 0.27 / VAS 6.5</td>
<td>No correlation between IOP reduction and changes in visual function between the 3 medications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BCVA logMAR score 0.24 / VAS 7.4</td>
<td>BCVA logMAR -0.03/ VAS 0.23</td>
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<tr>
<td></td>
<td></td>
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<td>BCVA logMAR -0.04/ VAS 0.78</td>
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<td></td>
<td></td>
<td>BCVA logMAR -0.04/ VAS 0.68</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>At 4 weeks</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>At 12 months</td>
<td></td>
</tr>
<tr>
<td>Ravalico 1994³⁴</td>
<td>Levocabunolol 0.5% Untreated</td>
<td>Not reported</td>
<td>VA unchanged during study</td>
<td>Visual acuity inclusion criteria 20/20. Claims “no variation” in visual acuity</td>
</tr>
<tr>
<td>Schuman 1997³²</td>
<td>Brimonidine Timolol 0.5%</td>
<td>Not reported</td>
<td>Loss of 2 lines or more VA (5.9%)</td>
<td>Changes in VA assumed to be due to cataract formation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Loss of 2 lines or more VA (9.5%)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>At 12 months</td>
<td></td>
</tr>
<tr>
<td>Tuulonen 1989³⁵</td>
<td>Laser Medical treatment</td>
<td>Not reported</td>
<td>Not reported</td>
<td>Visual acuity was measured at baseline and at 1 year. No values have been provided but it has been reported that there were no significant differences between the two groups</td>
</tr>
<tr>
<td>Yamamoto 1996³⁶</td>
<td>Timolol 0.5% Carteolol 1% Carteolol 2%</td>
<td>Not reported</td>
<td>Not reported</td>
<td>Visual acuity was measured at baseline and at 16 weeks. No values have been provided but it has been reported that no changes were seen.</td>
</tr>
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</table>
### Evidence Table 6. KQ 3 24-hour studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Origin</th>
<th>Patients included</th>
<th>Comparators</th>
<th>Number of patients</th>
<th>Treatment specifics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larsson. 2001&lt;sup&gt;56&lt;/sup&gt;</td>
<td>Europe</td>
<td>OHT</td>
<td>Latanoprost 0.005%</td>
<td>27 pts all study</td>
<td>Wash out 4 w</td>
<td>Better effect on IOP with Latanoprost than Timolol. No effect on BP or HR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Timolol 0.5%</td>
<td>Cross over</td>
<td>Duration 4w</td>
<td></td>
</tr>
<tr>
<td>Orzalesi. 2006&lt;sup&gt;67&lt;/sup&gt;</td>
<td>Europe</td>
<td>OAG and OHT</td>
<td>Latanoprost 0.005%</td>
<td>44 pts all study</td>
<td>Wash out 4 w</td>
<td>All drugs decreased IOP. Better effect with Bimatoprost. No effect on BP.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bimatoprost 0.03%</td>
<td>Cross over</td>
<td>Duration 1m</td>
<td></td>
</tr>
<tr>
<td>Travoprost 0.04%</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Quaranta 2008&lt;sup&gt;70&lt;/sup&gt;</td>
<td>Europe</td>
<td>NTG</td>
<td>Latanoprost 0.005%</td>
<td>40 pts all study</td>
<td>Wash out 6 w</td>
<td>No significant difference in IOP or BP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bimatoprost 0.03%</td>
<td>Cross over</td>
<td>Duration 8w</td>
<td></td>
</tr>
<tr>
<td>Quaranta 2006&lt;sup&gt;71&lt;/sup&gt;</td>
<td>Europe</td>
<td>OAG</td>
<td>Latanoprost 0.005%</td>
<td>27 pts all study</td>
<td>Wash out 4w</td>
<td>All drugs decreased IOP. Better effect with Latanoprost. Some effect on BP with Timolol and Brimonidine.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Timolol 0.5%</td>
<td>Cross over</td>
<td>Duration 6w</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brimonidine 0.2%</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Dorzolamide 2%</td>
<td></td>
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</tr>
<tr>
<td>Yildirim 2008&lt;sup&gt;86&lt;/sup&gt;</td>
<td>Europe</td>
<td>OAG</td>
<td>Latanoprost 0.005%</td>
<td>17</td>
<td>Wash out NS</td>
<td>All drugs decreased IOP. No significant difference</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bimatoprost 0.03%</td>
<td>16</td>
<td>Duration 8w</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Travoprost 0.04%</td>
<td>15</td>
<td></td>
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<tr>
<td>Study</td>
<td>Region</td>
<td>Mean Follow-up</td>
<td>Inclusion IOP</td>
<td>Glaucoma type</td>
<td>Exclusion Criteria</td>
<td>Comparators</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Berry 1984 24</td>
<td>North America</td>
<td>26 weeks</td>
<td>≥26</td>
<td>POAG</td>
<td>Prior ocular surgery</td>
<td>Betaxolol Timolol</td>
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</tr>
<tr>
<td>Chiselita 2005 26</td>
<td>Europe</td>
<td>Not specified</td>
<td>&gt;21 with ß blockers</td>
<td>POAG</td>
<td>Prior ocular surgery within 12 months or laser within 6 months</td>
<td>Latanoprost Travoprost</td>
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<td></td>
<td></td>
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<td>Dorzolamide/Timolol</td>
</tr>
<tr>
<td>Dirks 2006 33</td>
<td>US</td>
<td>Not specified</td>
<td>mean IOP&lt;20</td>
<td>NTG</td>
<td>Prior ocular surgery within 3 months</td>
<td>Bimatoprost Latanoprost</td>
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<tr>
<td>Evans 2008 37</td>
<td>US</td>
<td>Not specified</td>
<td>≥21</td>
<td>POAG</td>
<td>Prior ocular surgery within 6 months</td>
<td>Latanoprost-Timolol</td>
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<td>Timolol-Latanoprost</td>
</tr>
<tr>
<td>Flammer 1992 39</td>
<td>Europe</td>
<td>12 months</td>
<td>&gt;21</td>
<td>POAG</td>
<td>Prior laser and surgery</td>
<td>Carteolol Timolol</td>
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<tr>
<td>Heijl 2000 43</td>
<td>Europe</td>
<td>Not specified</td>
<td>≥22</td>
<td>OHT</td>
<td>≥35, Prior ocular surgery</td>
<td>Timolol Placebo</td>
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<tr>
<td>Herman (OHTS) 2006 44</td>
<td>US</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Observation Topical hypotensives</td>
</tr>
<tr>
<td>Krupin 2011 24</td>
<td>North America</td>
<td>30 months</td>
<td>IOP &lt;21mmHg</td>
<td>Low-pressure</td>
<td>Mean deviation worse than -16 decibels</td>
<td>Brimonidine Timolol</td>
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<tr>
<td>Marcon 1990 26</td>
<td>Europe</td>
<td>Not specified</td>
<td>Not specified</td>
<td>POAG</td>
<td>Prior ocular surgery within 6 months</td>
<td>Betaxolol Levobunolol</td>
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<tr>
<td>Martinez 2010 41</td>
<td>Europe</td>
<td>5 years</td>
<td>≥20 under beta blocker monotherapy</td>
<td>POAG</td>
<td>Prior ocular filtering surgery</td>
<td>Dorzolamide-timolol</td>
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<td>Brinzolamide-timolol</td>
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<td>Melamed 2000 49</td>
<td>Asia</td>
<td>3 years</td>
<td>23-34</td>
<td>POAG</td>
<td>Prior ocular surgery or cataract surgery</td>
<td>Brimonidine Timolol</td>
</tr>
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</tr>
<tr>
<td>Messmer 1991 25</td>
<td>Europe</td>
<td>Not specified</td>
<td>≥24</td>
<td>POAG, early glaucomatous visual field defects and clinical evidence of glaucomatous optic nerve damage</td>
<td>Prior ocular surgery or laser</td>
<td>Betaxolol Timolol</td>
</tr>
<tr>
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<tr>
<td>Miglior 2005 24</td>
<td>Europe</td>
<td>55.3 Months</td>
<td>22-29</td>
<td>POAG</td>
<td>Prior ocular surgery</td>
<td>Dorzolamide Placebo</td>
</tr>
<tr>
<td>Mirza 2000 25</td>
<td>Europe</td>
<td>90 Days</td>
<td>&gt;21</td>
<td>POAG</td>
<td>Prior ocular surgery or laser</td>
<td>Timolol Carteolol Metipranolol</td>
</tr>
<tr>
<td>Study</td>
<td>Region</td>
<td>Mean Follow-up</td>
<td>Inclusion IOP</td>
<td>Glaucoma type</td>
<td>Exclusion Criteria</td>
<td>Comparators</td>
</tr>
<tr>
<td>---------------</td>
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<td>---------------------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Prata 2009</td>
<td>South America</td>
<td>4 Weeks</td>
<td>&gt;21</td>
<td>OAG</td>
<td>Not specified</td>
<td>Timolol</td>
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<td></td>
<td></td>
<td></td>
<td>Brimonidine, Travoprost</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Betaxolol</td>
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<td></td>
<td></td>
<td>Placebo</td>
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<td></td>
<td></td>
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<tr>
<td>Rainer 2003</td>
<td>Europe</td>
<td>Not specified</td>
<td>&lt;21</td>
<td>POAG</td>
<td>Prior ocular surgery</td>
<td>Betaxolol, Placebo</td>
</tr>
<tr>
<td>Tuulonen 1989</td>
<td>Europe</td>
<td>16 months (laser)</td>
<td>≤22</td>
<td>Simple or capsular glaucoma</td>
<td>Prior ocular surgery or laser</td>
<td>Laser, Medical</td>
</tr>
<tr>
<td>Tuulonen 1989</td>
<td>Europe</td>
<td>18.3 months (medical)</td>
<td>≤22</td>
<td>Simple or capsular glaucoma</td>
<td>Prior ocular surgery or laser</td>
<td>Laser, Medical</td>
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<tr>
<td>Vainio-Jylha  1999</td>
<td>Europe</td>
<td>Not specified</td>
<td>Not specified</td>
<td>POAG</td>
<td>Not specified</td>
<td>Betaxolol, Timolol</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Yamamoto 1996</td>
<td>Asia</td>
<td>Not specified</td>
<td>Not specified</td>
<td>OHT, POAG</td>
<td>Prior ocular surgery</td>
<td>Timolol 0.5%, Carteolol 1%, Carteolol 2%</td>
</tr>
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</tbody>
</table>
### Evidence Table 8. KQ 4 medical outcomes

<table>
<thead>
<tr>
<th>Study</th>
<th>Comparators</th>
<th>Visual Field Mean Deviation at baseline</th>
<th>Visual Field Mean Deviation at follow-up</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berry 198424</td>
<td>Betaxolol Timolol</td>
<td>Not reported</td>
<td>Not reported</td>
<td>Small changes, consistent with glaucomatous damage, were observed between the visual fields before treatment and at 26 weeks in three betaxolol-treated and two timolol-treated patients. These changes were considered to be within the expected normal range of variation.</td>
</tr>
<tr>
<td>Chiselita 200526</td>
<td>Latanoprost 0.005% Travoprost 0.004% Dorzalamide/Timolol</td>
<td>Entire study MD= -4.01</td>
<td>Entire study MD= -4.68 ± 4.51</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Dirks 200633</td>
<td>Bimatoprost 0.03% Latanoprost 0.005%</td>
<td>Not reported</td>
<td>Not reported</td>
<td>Defects of visual field in one patient in the latanoprost group worsened in both eyes. No other changes were reported during the 3 months.</td>
</tr>
<tr>
<td>Evans 200837</td>
<td>Latanoprost - Timolol Timolol – Latanoprost</td>
<td>CS 3 cpd 1.35±0.11 CS 18cpd 0.86±0.23 MD -2.22±1.97 CS 3cpd 1.36±0.21 CS 18 cpd 0.77±0.30 MD -3.63±4.27</td>
<td>Increase in MD from -1.49 (at cross over) to -2.41 6 months</td>
<td>Significant loss in CS at 3cpd and 18 cpd Significant improvement in CS 3cpd</td>
</tr>
<tr>
<td>Flammer 199239</td>
<td>Carteolol Timolol</td>
<td>4.1 4.4</td>
<td>Not reported</td>
<td>Majority of the patients had a stable visual field, although few experienced either a deterioration or improvement after 1 year of treatment. There was no significant difference between groups.</td>
</tr>
<tr>
<td>Heijl 200043</td>
<td>Timolol 0.5% Placebo</td>
<td></td>
<td></td>
<td>At 5 years of follow-up, eight patients in the placebo group, and five patients in the timolol group developed glaucomatous field loss. No significant difference (P=0.53) in survival function between treatment groups during this period. At 10 years, 15 patients in the placebo group and seven patients in the timolol group had developed glaucoma. The Kaplan-Meier plot suggests a difference between the treatment groups, but the difference is not significant (P=0.07).</td>
</tr>
<tr>
<td>Herman (OHTS) 200644</td>
<td>Observation Topical hypotensives</td>
<td>0.21 0.28</td>
<td>-0.42±1.94 -0.20±1.57 Last follow-up (mean follow-up duration = 6.3 years)</td>
<td>No significant difference between the 2 groups</td>
</tr>
<tr>
<td>Study</td>
<td>Comparators</td>
<td>Visual Field Mean Deviation at baseline</td>
<td>Visual Field Mean Deviation at follow-up</td>
<td>Comments</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------</td>
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<td>----------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Krupin 2011</td>
<td>Brimonidine, Timolol</td>
<td>0.89 ± 0.2</td>
<td>Not reported</td>
<td>Primary outcome of the study was visual field progression. Fewer patients treated with Brimonidine (9.1%) had visual field progression than timolol-treated patients (39.2%) (p=0.001). However, more brimonidine-treated (28.3%) than timolol-treated (11.4%) patients discontinued treatment because of adverse events (p=0.008).</td>
</tr>
<tr>
<td>Marcon 1990</td>
<td>Betaxolol, Levobunol</td>
<td>Not reported</td>
<td>Not reported</td>
<td>One patient showed marked visual field improvement from baseline to 12 weeks in Betaxolol group, but there were no measurable changes in the other 19 patients in Betaxolol group and all 20 patients in Levobunol group.</td>
</tr>
<tr>
<td>Martinez 2010</td>
<td>Dorzolamide-timolol, Brinzolamide-timolol</td>
<td>-3.1 ±0.9, -3.1 ±0.9</td>
<td>Not reported</td>
<td>Mean deviation slopes during followup were -0.26 dB/year and -0.46 dB/year for the DT and BT treatment groups, respectively (p = 0.008). According to the event-based method, progression was observed in 24 eyes (24%) in the DT group and 55 eyes (47%) in the BT group (p = 0.0006; chi-square test).</td>
</tr>
<tr>
<td>Melamed 2000</td>
<td>Brimonidine 0.2%, Timolol 0.5%</td>
<td></td>
<td></td>
<td>In the brimonidine group (n =40), 36 patients had no change in visual fields (within 5 dB of baseline) and 2 patients had improvement. In the timolol group (n = 39), 36 patients had no change and 1 showed improvement. Two brimonidine and 2 timolol patients had worsening of visual fields &gt;5 dB from baseline.</td>
</tr>
<tr>
<td>Messmer 1991</td>
<td>Betaxolol 0.5%, Timolol 0.5%</td>
<td>2.2, 3.4</td>
<td>Not reported</td>
<td>In both treatment groups, visual fields tended to improve in the first 6 months and then remained stable or deteriorated. The treatment effect on visual fields was better in betaxolol group than in the timolol group.</td>
</tr>
<tr>
<td>Miglier 2005</td>
<td>Dorzolamide, Placebo</td>
<td>Not reported</td>
<td>Not reported</td>
<td>Visual field progression 38/407 in placebo group, 26/345 in dorzolamide group. Optic disc progression in 22/407 in placebo group, 20/345 in dorzolamide group.</td>
</tr>
<tr>
<td>Mirza 2000</td>
<td>Timolol 0.5%, Carteolol 2%, Metipranol 0.3%</td>
<td>5.0, 3.4, 3.8, 3 months</td>
<td>4.9±3.0, 3.9±2.5, 3.1±1.9</td>
<td>No significant differences between groups</td>
</tr>
<tr>
<td>Prata 2009</td>
<td>Timolol 0.5%, Brimonidine 0.2%, Travoprost 0.004%</td>
<td>-6.84, -5.45, -7.10</td>
<td>1.01±2.53, 0.68±2.70, 0.81±2.32</td>
<td>Significant improvement in MD from baseline to 1 month in all three arms. In the travoprost group alone there was a mean (0.81±2.32) improvement of nerve damage.</td>
</tr>
<tr>
<td>Rainer 2003</td>
<td>Betaxolol 0.25%, Timolol 0.5%</td>
<td>-3.6, -2.9</td>
<td>-2.6±6.1, -2.3±3.4, 3 months</td>
<td>No significant differences between groups. Significant difference from baseline to 3 months in Betaxolol group only.</td>
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<tr>
<td>Study</td>
<td>Comparators</td>
<td>Visual Field Mean Deviation at baseline</td>
<td>Visual Field Mean Deviation at follow-up</td>
<td>Comments</td>
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<td>---------------</td>
<td>------------------------------</td>
<td>----------------------------------------</td>
<td>------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
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<tr>
<td>Tuulonen 1989</td>
<td>Laser Medical</td>
<td>-7.4 ± 9.0</td>
<td>-8.6 ± 9.7 9.4 ± 8.5</td>
<td>No significant differences between group</td>
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<td></td>
<td></td>
<td>-9.1 ± 6.1</td>
<td>-9.4 ± 8.5 At 12 months</td>
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<tr>
<td>Vainio-Jylha 1999</td>
<td>Betaxolol 0.5% Timolol 0.25%</td>
<td>23.1±3.1</td>
<td>24.3±3.5 23.9±3.4</td>
<td>No significant differences between groups but differences were significant for within group comparisons</td>
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<tr>
<td></td>
<td></td>
<td>22.2±4.1</td>
<td>24 months</td>
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<tr>
<td>Yamamoto 1996</td>
<td>Timolol 0.5% Carteolol 1% Carteolol 2%</td>
<td>Not reported</td>
<td>Not reported</td>
<td>Visual field was considered to have progressed if there was a decline in light sensitivity of 10 dB or more at any points except the four superior most ones and/or deterioration in mean deviation of 2 dB or more. During the study there were no significant changes in visual field</td>
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## Evidence Table 9. KQ5

<table>
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<tr>
<th>Study</th>
<th>Patients included</th>
<th>Patients characteristics</th>
<th>Comparators</th>
<th>Number of patients</th>
<th>Study Design, Risk of bias</th>
<th>Outcomes</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montemayor 2001&lt;sup&gt;98&lt;/sup&gt;</td>
<td>POAG, NPG, Glaucoma suspects</td>
<td>-Mean age 64 years</td>
<td>different</td>
<td>224 patients</td>
<td>Cross-sectional, FAIR</td>
<td>correlation between the Visual Function Assessment and quality of life as measured by the EQ-5D health status tool</td>
<td>On multivariate analysis only visual acuity and visual field status were independently associated with visual function</td>
</tr>
<tr>
<td>Prata 2009&lt;sup&gt;69&lt;/sup&gt;</td>
<td>POAG</td>
<td>-Mean age 61 years</td>
<td>timolol maleate 0.5% vs brimonidine tartrate 0.2% vs travoprost 0.004% For 1 month</td>
<td>50 patients</td>
<td>RCT, GOOD</td>
<td>correlations between IOP and visual function changes</td>
<td>No significant correlations between IOP reduction and changes in visual function were found (P&lt;0.30).</td>
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### Evidence Table 10. Risk of bias for observational studies

<table>
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<tr>
<th>Study</th>
<th>Main outcome described</th>
<th>Patient characteristics described</th>
<th>Interventions of interest described</th>
<th>Principal confounder distribution in groups described</th>
<th>Selection Bias: Recruitment from same population</th>
<th>Selection Bias: Losses to follow-up take into account</th>
<th>Adequate adjustment for confounding</th>
<th>Industry Support</th>
<th>Industry Involvement</th>
<th>Overall Quality</th>
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<td>Alm 2004</td>
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<td>No</td>
<td>NA</td>
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<td>Arici 2000</td>
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<td>Yes</td>
<td>Yes</td>
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<td>Barnette 2010</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Good</td>
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<tr>
<td>Chiselita 2007</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<td>Yes</td>
<td>Unclear</td>
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<tr>
<td>Denis 2010</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Farris 2008</td>
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<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>Yes</td>
<td>Yes</td>
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<td>Jeganathan 2008</td>
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<tr>
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<td>Yes</td>
<td>Yes</td>
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<td>No</td>
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<td>Yes</td>
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<td>Yes</td>
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<td>No</td>
<td>NA</td>
<td>Fair</td>
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<td>Zimmerman 2003</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>No</td>
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## Evidence Table 11. KQ 6 medical I

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<thead>
<tr>
<th>Study</th>
<th>Comparators</th>
<th>Pat/ eyes</th>
<th>Eye irritation N(%)</th>
<th>Eye watering N (%)</th>
<th>Eye redness N (%)</th>
<th>Discomfort N(%)</th>
<th>↓visual acuity N(%)</th>
<th>Inflamm. N (%)</th>
<th>Ocular surface disease N (%)</th>
<th>Conj. injection N (%)</th>
<th>Iris color change N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denis 2010&lt;sup&gt;103&lt;/sup&gt;</td>
<td>Latanoprost therapy in patients with IOP 20 to &lt;24 Latanoprost therapy in patients with IOP &gt;=24</td>
<td>262</td>
<td>28 (10.7)</td>
<td>8 (3.1)</td>
<td>0</td>
<td>2 (0.8)</td>
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<td>Barnett 2010&lt;sup&gt;101&lt;/sup&gt;</td>
<td>Medication vs Observation Reported for the Entire study</td>
<td>328</td>
<td>28 (8.5)</td>
<td>11 (3.4)</td>
<td>1 (0.3)</td>
<td>3 (0.9)</td>
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<td>Quaranta, 2008&lt;sup&gt;70&lt;/sup&gt;</td>
<td>Bimatoprost</td>
<td>40</td>
<td>8 (20)</td>
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<td>3 (7.5)</td>
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<td>16 (40)</td>
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<td>Quaranta, 2008&lt;sup&gt;70&lt;/sup&gt;</td>
<td>Latanoprost</td>
<td>40</td>
<td>6 (15)</td>
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<td>3 (7.5)</td>
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<td>6 (15)</td>
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<tr>
<td>Farris 2008&lt;sup&gt;104&lt;/sup&gt;</td>
<td>Monotherapy with travoprost Concomitant therapy with travoprost and latanoprost</td>
<td>60 (eyes)</td>
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<td>Sharpe 2007&lt;sup&gt;109&lt;/sup&gt;</td>
<td>Latanoprost</td>
<td>263</td>
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<tr>
<td>Chiselita 2005&lt;sup&gt;102&lt;/sup&gt;</td>
<td>Travoprost 0.04%</td>
<td>1109</td>
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<td>Thlen 2007&lt;sup&gt;111&lt;/sup&gt;</td>
<td>Latanoprost</td>
<td>353</td>
<td>34 (9.6)</td>
<td>73 (20.7)</td>
<td>7 (21.2)</td>
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<tr>
<td>Dirks 2006&lt;sup&gt;112&lt;/sup&gt;</td>
<td>Bimatoprost</td>
<td>33</td>
<td></td>
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<td>7 (21.2)</td>
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<td>27</td>
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<td>Orzalesi 2006&lt;sup&gt;26&lt;/sup&gt;</td>
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<td>38 (eyes)</td>
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<td>Orzalesi 2006&lt;sup&gt;26&lt;/sup&gt;</td>
<td>Travoprost</td>
<td>38 (eyes)</td>
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<td>1 (2.6)</td>
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<td>Orzalesi 2006&lt;sup&gt;26&lt;/sup&gt;</td>
<td>Timolol/dorzalamide fixed combination</td>
<td>38 (eyes)</td>
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<td>Miglior 2005&lt;sup&gt;84&lt;/sup&gt;</td>
<td>Dorzalamide</td>
<td>536</td>
<td>463 (86.4)</td>
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<td>Miglior 2005&lt;sup&gt;84&lt;/sup&gt;</td>
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<td>540</td>
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<td>Alm 2004&lt;sup&gt;99&lt;/sup&gt;</td>
<td>Latanoprost (as adjunctive therapy)</td>
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<td>131 (34.5)</td>
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<td>Study</td>
<td>Comparators</td>
<td>Pat/ eyes</td>
<td>Eye irritation N (%)</td>
<td>Eye watering N (%)</td>
<td>Eye redness N (%)</td>
<td>Discomfort N (%)</td>
<td>↓visual acuity N (%)</td>
<td>Inflamm. N (%)</td>
<td>Ocular surface disease N (%)</td>
<td>Conj. injection N (%)</td>
<td>Iris color change N (%)</td>
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## Evidence Table 12. KQ6 medical II

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### Evidence Table 13. KQ1 surgical population, visual acuity and visual impairment

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<td>Uncontrolled POAG</td>
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<td>DS only, DS w/MMC</td>
<td>21 pat/18 pat</td>
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<td>Europe</td>
<td>49.5 m</td>
<td>Baseline IOP, Uncontrolled &gt;22</td>
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<td>13 eyes/13 eyes</td>
<td>79.3</td>
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**Abbreviations:** IOP given in mmHg; OAG = Open angle glaucoma; POAG = Primary open angle glaucoma; NTG = Normal tension glaucoma; OHT = Ocular hypertension; DS = Deep sclerectomy; NPDS = Non penetrating deep sclerectomy
<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention</th>
<th>Specification</th>
<th>Adjuvant</th>
<th>Administration Route</th>
<th>Dose</th>
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<td>Trabeculectomy</td>
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<td>Mitomycin-C</td>
<td>Sponge</td>
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<td>Visual Acuity at baseline</td>
<td>Visual Acuity at Follow-up/timepoint</td>
<td>Comments</td>
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<td>-------------------------------------------</td>
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<td>Trabeculectomy Ex-PRESS shunt</td>
<td>NR</td>
<td>24.3 % improved 62.1 % Unchanged 13.5 % Declined 18.4 % improved 15.8 % Declined</td>
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<td>NPDS PT</td>
<td>BCVA 0.7 +/- 0.1 BCVA 0.8 +/- 0.1</td>
<td>BCVA 0.6 +/- 0.1 BCVA 0.4 +/- 0.1 At 12 months</td>
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<td>Snellen VA &lt; 20/40 (53.9%)</td>
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<td>Thimmarayan 2006</td>
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<td>Uncontrolled IOP</td>
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<td>Prior ocular surgery</td>
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C-48
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<th>Procedure</th>
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<td>Prior ocular surgery</td>
<td>1) Trabeculectomy 2) Trabeculectomy with MMC 3) Trabeculectomy with ePTFE 4) Trabeculectomy with MMC and ePTFE</td>
<td>15 eyes 15 eyes 15 eyes 15 eyes</td>
<td>71.1 68.1 67.2 65.3</td>
<td>28.6 30.9 35.3 30.6</td>
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<td>Not specified</td>
<td>≥22 mmHg</td>
<td>Prior ocular surgery</td>
<td>Sulodexide 5-FU</td>
<td>22 eyes 19 eyes</td>
<td>57.8 63</td>
<td>26 28</td>
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<td>Eliezer 2006&lt;sup&gt;55&lt;/sup&gt;</td>
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<td>&gt;22 mmHg</td>
<td>Previous failed glaucoma surgery</td>
<td>1) Conventional trabeculectomy 2) SIT</td>
<td>40 eyes,40 pat 40 eyes,40 pat</td>
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<td>29.8 5 30.2 0</td>
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<td>17.7 m</td>
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<td>5-FU (1&lt;sup&gt;st&lt;/sup&gt; trial) 5-FU (2&lt;sup&gt;nd&lt;/sup&gt; trial) Mitomycin C</td>
<td>20 pat 37 pat 44 pat</td>
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<td>126 m</td>
<td>Baseline IOP &gt;21 OAG</td>
<td>pigmentary, pseudoexfoliative, NTG, prior ocular surgery</td>
<td>MCC-TE BSS-TE</td>
<td>67 pat 47 pat</td>
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<td>Not specified</td>
<td>Aphakia, pseudophakia, failed filtering surgery</td>
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<td>69.33 69.08</td>
<td>26 28</td>
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<td>Kim 1998&lt;sup&gt;88&lt;/sup&gt;</td>
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<td></td>
<td>0.5-1 minute MMC 3-5 minute MMC No MMC</td>
<td>50 pat 38 pat 36 pat</td>
<td>60.5 63.4 65.8</td>
<td>32.7 30.2 29.7</td>
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<tr>
<td>El Sayyad 1999&lt;sup&gt;44&lt;/sup&gt;</td>
<td>Asia</td>
<td>Not specified</td>
<td>35-90 years, &gt;21 mmHg with maximal medical therapy</td>
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<td>Fornix-based flap Limbal-based flap</td>
<td>29 eyes,29 pat 29 eyes, 29 pat</td>
<td>51.3 51.3</td>
<td>33.9 33.0</td>
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</tbody>
</table>

**Deep Sclerectomy**

| Russo 2008<sup>79</sup> | Eur | 47 for NPDS 46 for PT | prior cataract surgery | NPDS Trabeculectomy | 43 eyes/43 pat 50 eyes/50 pat | 66.3 68.2 | 25.3 26.0 |
| Mielke 2006<sup>63</sup> | Af | 16.4 m | uncontrolled POAG | DS only DS w/MMC | 21 pat 18 pat | 60 62 | 29.5 26.4 |

**Other Treatments**

<p>| Fea 2010&lt;sup&gt;78&lt;/sup&gt; | Eur | Not specified | &gt;18 mmHg | | Phaco + stent Phaco only | 12 pat 24 pat | 64.5 64.9 | 17.9 17.3 |</p>
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<tr>
<th>Kobayashi</th>
<th>Asia</th>
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<th>Phacoviscocanalostomy</th>
<th>Phacotrabeculectomy</th>
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<th>20 eyes, 20 pat</th>
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<th>71.0</th>
<th>24.0</th>
<th>23.7</th>
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<table>
<thead>
<tr>
<th>Study</th>
<th>Comparators</th>
<th>Specification</th>
<th>Adjuvant</th>
<th>Administration Route</th>
<th>Dose</th>
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<tr>
<td>deJong 200930</td>
<td>Trabecular bypass</td>
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<td>Trabeculectomy</td>
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<td>Mitomycin-C</td>
<td>Sponge</td>
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<td>360°, 400 nm, 3 ns, the laser energy was half of the therapeutic energy used in the control group (usually ranging 0.3 to 0.5 mJ)</td>
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Abbreviations: Trab= trabeculectomy, MMC= Mitomycin C, SLT= Selective laser trabeculoplast, ALT= Argon laser trabeculoplasty, SpLT, PI= Peripheral iridectomy, NDS= Non-penetrating deep sclerectomy, DS= Deep sclerectomy, BSS= balanced salt solution, PT= Phacotrabeceuctomy, AM= amniotic membrane, PGTP= Primary glaucoma triple proced
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<td>Sanders, 1993</td>
<td>Intrascleral MMC</td>
<td>12 (eyes)</td>
<td>leakage</td>
<td>4 (20)</td>
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<td>Jay, 1989</td>
<td>Nasal trab</td>
<td>20</td>
<td>leakage</td>
<td>1 (5)</td>
<td>shallow AC</td>
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<td>53</td>
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<td>3 (16.7)</td>
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<td>Fornix-based flap</td>
<td>19</td>
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<td>5 (33.3)</td>
<td>Peripheral anterior</td>
<td>1 (5.3)</td>
<td>synechiae</td>
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<td>Cillino, 2008</td>
<td>Trab</td>
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<td>Shallow AC</td>
<td>4 (26.7)</td>
<td>Flat AC</td>
<td>1 (6.7)</td>
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<td>2 (13.3)</td>
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<td>Trab+E-PTFE</td>
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<td>2 (13.3)</td>
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<td>Tang, 2011</td>
<td>SLT half of</td>
<td>39</td>
<td>Redness</td>
<td>8 (20.5)</td>
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<td></td>
<td>SLT conventional</td>
<td>35</td>
<td>Redness</td>
<td>11 (31.4)</td>
<td>Peripheral anterior</td>
<td>1 (2.9)</td>
<td>synechiae</td>
<td></td>
<td>Transient IOP spike</td>
<td>3 (8.6)</td>
<td>Mild pain</td>
<td>4 (11.4)</td>
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<tr>
<td>Study</td>
<td>Origin</td>
<td>Follow up</td>
<td>Inclusion Criteria</td>
<td>Exclusion</td>
<td>N patients/eyes</td>
<td>Mean age</td>
<td>Mean IOP</td>
<td>Comparators</td>
<td>Specifications</td>
<td>Notes</td>
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<td>Tuulonen 1989&lt;sup&gt;93&lt;/sup&gt;</td>
<td>Eur</td>
<td>16 m laser, 18.3m medication</td>
<td>NA</td>
<td>NA</td>
<td>19 pat</td>
<td>69.6</td>
<td>29.4</td>
<td>Laser Trabeculoplasty Vs Medical (Timolol 0.5%, Acetazolamide 250mg Pilocarpine 2%)</td>
<td>360 degrees, 0.7-0.95 Watt, 0.1 s, 50 micron spot size</td>
<td>Patients were randomized to laser or medical treatment and followed up. Additional treatment was added as required: medical, laser or trabeculectomy. Pilocarpine and Acetazolamide added to regime if IOP &gt; 22 mmHg or disease progression</td>
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<td>Lai 2004&lt;sup&gt;39&lt;/sup&gt;</td>
<td>China</td>
<td>5 years</td>
<td>POAG or OHT, IOP &gt;21 mmHg</td>
<td>laser trabeculoplasty, intraocular surgery disturbing the aqueous outflow, ocular inflammation,.</td>
<td>64 eyes, 32 patients</td>
<td>52</td>
<td>26.2</td>
<td>selective laser trabeculoplasty vs β-blocker, pilocarpine, dorzolamide and latanopros</td>
<td>360°, initial laser energy was set at 0.8 mJ.</td>
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<td>Study</td>
<td>Patients included</td>
<td>Patient characteristics</td>
<td>Comparators</td>
<td>Number of patients</td>
<td>Study Design, Risk of bias</td>
<td>Outcomes</td>
<td>Results</td>
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<td>CIGTS 2001</td>
<td>POAG, PXF, pigmentary Glaucoma</td>
<td>-age range 35-64 -55% white, 38% black</td>
<td>Trabeculectomy (with or without 5-fluorouracil), if treatment failed ALT, then sequence of medications, then repeating trabeculectomy with anti-fibrotic agents, then repeating medications vs. Medications, starting with topical beta-blocker followed by other topical agents (up to three), then alternative topical and/or oral medications. If treatment failed ALT, then trabeculectomy (with or without 5-fluorouracil), repeating medication, repeating trabeculectomy with anti-fibrotic agents, repeating medication</td>
<td>607 patients</td>
<td>RCT 1. Low 2. Low 3. Unclear 4. Low 5. Un</td>
<td>Total VAQ: No statistically significant differences. On VAQ acuity subscale, adjusted for baseline variables, primary surgery was associated more dysfunction than initial medical treatment (p = 0.02). - Symptom and health problem check list : Overall decrease in both groups. 12 symptoms were more reported in the surgical group and 7 symptoms were more reported in the medical group Surgical patients reporting 22% more symptom bothersomeness related to visual function - No statistically significant differences on the Glaucoma Health Perceptions Index - Fear of blindness decreased in both groups and was not associated with a specific treatment</td>
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<td>Javitt 2000</td>
<td>POAG, OHT</td>
<td>-mean age 58 -56% white, 39% black</td>
<td>Brimonidine tartrate 0.2% twice daily vs. Timolol maleate 0.05% twice daily For 4 months</td>
<td>219 patients</td>
<td>RCT 1. Low 2. Low 3. Low 4. High 5. High</td>
<td>- Short Form-36 Health Survey (SF-36) no statistically significant changes in QOL</td>
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<td>EMGT 2005</td>
<td>POAG, NTG, PXF</td>
<td>-mean age 68 -mean visual acuity 0.9</td>
<td>No treatment vs. Betaxolol 5mg/ml twice daily and ALT, Latanoprost if IOP exceeds 25mmHg</td>
<td>255 patients</td>
<td>RCT 1. Low 2. Low 3. Low 4. High 5. Low</td>
<td>Swedish translation of the NEI VFQ-25 Treatment was not associated with change in QOL</td>
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<td>Konstas 2003</td>
<td>PXF with OHT, PXF</td>
<td>-mean age 70 -average visual acuity 20/40</td>
<td>Latanoprost 0.005% once daily vs. Timolol maleate/Dorzolamide fixed combination twice daily Each for 2 months</td>
<td>54 patients</td>
<td>Randomized cross-over trial 1. Unclear 2. Unclear 3. Low 4. High 5. Unclear</td>
<td>Preference for one treatment arm 80% preferred latanoprost vs. 20% Timolol/Dorzolamide (mostly because of convenience)</td>
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<td>Study</td>
<td>Patients included</td>
<td>Patient characteristics</td>
<td>Comparators</td>
<td>Number of patients</td>
<td>Study Design, Risk of bias</td>
<td>Outcomes</td>
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<tr>
<td>Schenker 199981</td>
<td>POAH and OHT</td>
<td>-mean age 59 -70 % white, 24% black</td>
<td>Timolol Gel once daily vs. Timolol Solution twice daily Each for 6 weeks</td>
<td>202 patients</td>
<td>Randomized cross-over trial</td>
<td>-Antiglaucoma patient-preference questionnaire (includes: satisfaction, compliance)</td>
<td>-71% preferred timolol gel vs. 29% timolol solution (mostly because of frequency of usage) -there was no statistically significant difference for satisfaction -compliance was statistically significant higher with timolol gel</td>
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<td>Solish 200489</td>
<td>POAG, OHT, PXF and pigmentary Glaucoma</td>
<td>-Mean age 64 -65% white, 25% black -45% had visual field defects</td>
<td>0.5% Timolol maleate/ 2% Dorzolamide fixed combination twice daily vs 0.5% Timolol maleate and 0.2% Brimonidine twice daily For 6 months</td>
<td>492 patients</td>
<td>RCT</td>
<td>-Convenience -Satisfaction (On a 7 point scale)</td>
<td>Both treatments were convenient for &gt;80% of patients and satisfied &gt; 82% of the patients. Dorzolamide/timolol fixed combination was better than Brimonidine+ Timolol, regarding convenience but this did not reach statistical significance.</td>
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<td>Simmons 2002117</td>
<td>POAG, OHT, PXF</td>
<td>-Mean age 65 -66% white, 24% black</td>
<td>0.2% Brimonidine Vs Latanoprost 0.005% For 3 months</td>
<td>115 patients</td>
<td>RCT</td>
<td>-Glaucoma disability index</td>
<td>Patients in the latanoprost group were more likely to report negative quality-of-life variables than patients in the brimonidine group</td>
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<td>Cantor 2001118</td>
<td>POAG, OHT, PXF</td>
<td>-Mean age 59 -77% white, 17% black</td>
<td>Brimonidine Vs Betaxolol For 1 month</td>
<td>159 patients</td>
<td>RCT</td>
<td>-Glaucoma disability index</td>
<td>Mean scores on the GDI did not change significantly from baseline in either treatment group,</td>
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<td>Javitt 2000119</td>
<td>POAG, OHT</td>
<td>-Mean age 61 -82% white, 15% black</td>
<td>Brimonidine Vs Betaxolol For 4 months</td>
<td>188 patients</td>
<td>RCT</td>
<td>-Glaucoma disability index</td>
<td>There were no significant between-group differences in the incidence of adverse events or in the quality of life summary scores.</td>
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References


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102 Chiselita D. Evaluation of the role of travoprost 0.004% ophthalmic solution in the management of open angle glaucoma and ocular hypertensive patients. Ofthalmologia 2007; 51(2):81-6.
104 Farris EP. Efficacy and tolerability of a large scale change in regimen from latanoprost to travoprost in glaucoma patients at the Manhattan Veterans Administration Hospital. Clin Ophthalmol 2008; 2(2):303-12.


Appendix D. Excluded Articles

- "[A new beta blocking agent in the treatment of chronic open-angle glaucoma: timolol maleate]
  Foreign language
  It is not a RCT and has less than 100 patients
- "[Trabeculotomy]. Fortschr Ophthalmol 87; 84 Suppl: S148-76.
  It is a case series
  It is a case series
  Data not abstractable
- "Abelson, M. B., Netland, P. A., and Chapin, M. J. Switching patients with glaucoma or ocular hypertension from dual therapy to monotherapy: evaluation of brimonidine as a model
  Unique comparators
  Does not address any key questions (see below for questions). It is not a RCT and has less than 100 patients
- "Abramov, V. G. and Vakurin, E. A. [Results of trabeculectomy in primary open-angle glaucoma]
  Foreign language
  Foreign language
- "Abramov, V. G., Vakurin, E. A., Il’in, V. P., and Shiraeva, N. V. [Late results of trabeculectomy in open-angle glaucoma]
  Foreign language
  Systematic review
- "Accorinti, M., Ciapparoni, V., Pirraglia, M. P., and Pivetti-Pezzi, P. Treatment of severe ocular hypotony in AIDS patients with cytomegalovirus retinitis and cidofovir-associated uveitis
  Medical KQ 3 only
- "Adachi, M., Shirato, S., Kaburagi, T., and Suzuki, Y. [Ten-year results of argon laser trabeculoplasty]
  Foreign language
  Other (specify): pilocarpine
  No original data (e.g., systematic review, narrative review, editorial, letter)
- "Adamsons, I., Andersson, K. W., Strohmaier, K. M., and Clineschmidt, C. M. Three month results of a clinical trial comparing 0.5% timolol/2.0% MK-507 combination to concomitant use of 0.5% timolol and 2.0% MK-507
  Meeting abstract
- "Adamsons, I., Boyle, J., and Ghosh, K. A Randomized Trial Comparing the Dorzolamide/Timolol Combination to Monotherapy with Timolol or Dorzolamide
  Meeting abstract
  Medical KQ 3 or KQ 3 and KQ 6 only
• "Adamsons, I., Clineschmidt, C., et al. The efficacy and safety of dorzolamide as adjunctive therapy to timolol maleate gellan solution in patients with elevated intraocular pressure
Medical KQ 3 or KQ 3 and KQ 6 only
Other (specify): not FDA approved, Does not include treatment for open-angle glaucoma (medical, surgical or combined)
It is not a RCT and has less than 100 patients
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
It is not a RCT and has less than 100 patients
Does not include treatment for open-angle glaucoma (medical, surgical or combined)
OAG can’t be analyzed separately
• "Agarwal, R. and Agarwal, P. Future target molecules in antiglaucoma therapy: tgf-Beta may have a role to play
Systematic review
Data not abstractable
It is not a RCT and has less than 100 patients
No original data (e.g., systematic review, narrative review, editorial, letter)
OAG can’t be analyzed separately
• "Ahmad Lone, I., Rizvi, A., Saajdad Ahmad, S., and Ahmad Unto, R. Comparison of latanoprost and dorzolamide in patients with open angle glaucoma
Medical KQ 3 or KQ 3 and KQ 6 only
• "Ahmad, S. Cardiopulmonary effects of timolol eyedrops. Lancet 79 ; 2 (8150): 1028 .
It is a case series
Foreign language
• "Airaksinen, P. J. The long-term hypotensive effect of timolol maleate compared with the effect of pilocarpine in simple and capsular glaucoma. Acta Ophthalmol (Copenh) 79 ;57 (3): 425-34 .
Does not address any key questions
Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Other (specify): Inadequate control


OAG can't be analyzed separately

- "Akafo, S. K., Thompson, J. R., and Rosenthal, A. R. A cross-over trial comparing once daily levobunolol with once and twice daily timolol Medical KQ 3 or KQ 3 and KQ 6 only


Other (specify): Average age below 50

- "Akingbehin, T. and Villada, J. R. Metipranolol-induced adverse reactions: II. Loss of intraocular pressure control. Eye (Lond) 92;
  6 ( Pt 3) : 280-3.

Does not address any key questions


Does not address any key questions

- "Akman, A., Cetinkaya, A., Akova, Y. A., and Ertan, A. Comparison of additional intraocular pressure-lowering effects latanoprost vs brimonidine in primary open-angle glaucoma patients with intraocular pressure uncontrolled by timolol-dorzolamide combination Medical KQ 3 or KQ 3 and KQ 6 only

- "Akman, A., Cetinkaya, A., Akova, Y. A., and Ertan, A. Comparison of additional intraocular pressure-lowering effects of latanoprost vs brimonidine in primary open-angle glaucoma patients with intraocular pressure uncontrolled by timolol-dorzolamide combination Medical KQ 3 only

- "Akopian, V. S. and Kazakova, E. L. [Effectiveness of repeat laser trabeculoplasty in open-angle glaucoma]

Foreign language

- "Alagoz, G., Bayer, A., Boran, C., Serin, D., Kukner, A., and Elcioglu, M. Comparison of ocular surface side effects of topical travoprost and bimatoprost med RCT included only for KQ 6

- "Alagoz, G., Gurel, K., Bayer, A., Serin, D., Celebi, S., and Kukner, S. A comparative study of bimatoprost and travoprost: effect on intraocular pressure and ocular circulation in newly diagnosed glaucoma patients Medical KQ 3 or KQ 3 and KQ 6 only


OAG can't be analyzed separately

- "Alberta Heritage Foundation for Medical Research. AquaFlow(R)
  (Structured abstract)

Meeting abstract


Does not address any key questions


- "Alegre N·±ez, Juan R, GarcÆa -lvarez, Hernbn, Hernbndez Pe±a, Eduardo, and OrtÆz Berm·dez, Osmany. TrabeculectomÆa con 5-
  fluorouracilo transoperatorio

Foreign language

- "Alekseev, B. N., Basov, G. V., and Mostovoi, E. N. [The late results of a trabeculoretraction operation]

Foreign language


OAG can't be analyzed separately


No original data (e.g., systematic review, narrative review, editorial, letter)

Does not include treatment for open-angle glaucoma (medicinal, surgical or combined)


Does not include treatment for open-angle glaucoma (medicinal, surgical or combined)

• "Allaire, C., Trinquand, C., Nordmann, J. P., Dascotte, J. C., George, J. L., Lesure, P., Rouland, J. F., Khaitrine, L., and Sirbat, D. [Hypotensive action of 0.5% carteolol versus 0.1% timolol in patients with intraocular hypertension]

Foreign language


Meeting abstract


Medical KQ 3 or KQ 3 and KQ 6 only


Other (specify):not FDA approved, not used"

• "Alm, A. and Stjernschantz, J. Effects on intraocular pressure and side effects of 0.005% latanoprost applied once daily, evening or morning. A comparison with timolol. Scandinavian Latanoprost Study Group

Duplicate 8422

• "Alm, A. and Stjernschantz, J. Effects on intraocular pressure and side effects of 0.005% latanoprost applied once daily, evening or morning: A comparison with timolol

Medical KQ 3 or KQ 3 and KQ 6 only

• "Alm, A. and Stjernschantz, J. Effects on IOP and Side-Effects of 0.005% Latanoprost Once Daily, Evening or Morning: A Comparison with Timolol. &Dagger;

Meeting abstract

• "Alm, A. and Widengard, I. Latanoprost: experience of 2-year treatment in Scandinavia

Medical KQ 3 or KQ 3 and KQ 6 only

• "Alm, A. Can NSAIDs and prostaglandin analogues be combined?. Br J Ophthalmol 2006 ;90 (3): 259-60 .

No original data (e.g., systematic review, narrative review, editorial, letter)

• "Alm, A. Comparative phase III clinical trial of latanoprost and timolol in patients with elevated intraocular pressure

Medical KQ 3 or KQ 3 and KQ 6 only


No original data (e.g., systematic review, narrative review, editorial, letter)


Other (specify):Not an approved medication in the US


Does not address any key questions


Meeting abstract

• "Almeida, Homero G. de. Tratamento prqvio com colÆrio de aspirina na trabeculoplastia com laser de argônio

Foreign language
• "Almeida, Homero Gusmão de and Figueiredo, Carlos Lucas de. Encapsulamento da bolsa filtrante pós-trabeculectomia: estudio retrospectivo de quatro anos

Foreign language

No subjects with open-angle glaucoma
• "Almodin, Juliana, Pedroso, Eduardo Cavalheiro, Cvintal, Tadeu, and Almodin, Flavia. Comparacao pressao intraocular entre facoesclerectomia profunda e facotrabeculectomia: Intraocular pressure and visual results from combined surgery

Foreign language
• "Alonso, M. A., Duch, S., Cadarso, L., Palomar, A., and De La Camara, J. Effect of Levo Moprolol 0.9% drops on intraocular pressure: Application in ocular hypertension and open angle glaucoma: Efecto levo moprolol colirio al 0.9% sobre la presion intraocular: Aplicacion en la hipertension y en el glaucoma cronico simple

Foreign language
• "Alonso, M. A., Duch, S., Cadarso, L., Palomar, A., and De, L. C. J. Effect of Levo Moprolol 0.9% drops on intraocular pressure: Application in ocular hypertension and open angle glaucoma

Duplicate

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

It is a case series

Meeting abstract
• "Altman, B., Craven, E. R, Shams, N. B K, Haque, R., Kapik, B., and Peloso, C. Safety of the docosanoid unoprostone isopropyl 0.15% when used adjunctively with brimonidine tartrate 0.2% or dorzolamide HCL 2.0% in patients with primary open-angle glaucoma or ocular hypertension

Meeting abstract

Data not abstractable
• "Alvi, N. P., Cantor, L. B., Hoop, J. S., Sanders, S. P., Bhavnani, V. D., and Brizendine, E. J. LONG TERM COMPARISON OF 0.1 VERSUS 0.2 MG/CC OF MITOMYCIN C IN PRIMARY TRABFCULECIOMY

Meeting abstract
• "Alward, W. L. and Lewis, R. A. TRABECULECTOMY VS. THERMOSCLEROSTOMY: A TEN-YEAR FOLLOW-UP

Meeting abstract
• "Alward, W. L. Additive efficacy of unoprostone isopropyl 0.12% (rescula) to latanoprost 0.005%. Am J Ophthalmol 2001 ;132 (3): 449-51

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

No original data (e.g., systematic review, narrative review, editorial, letter)

Systematic review

OAG can’t be analyzed separately

It is not a RCT and has less than 100 patients

No subjects with open-angle glaucoma, No original data (e.g., systematic review, narrative review, editorial, letter)
• "Amorim Filho, Walter Gomes, Moreira, Josq Belmiro de Castro, and Rehder, Jose Ricardo Carvalho Lima. Controle da pressão intra-ocular com pilocarpina a 4% nas formas gel e col/Erí
Foreign language
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
Does not address any key questions
OAG can’t be analyzed separately
• "Anand, N., Mielke, C., and Dawda, V. K. Trabeculectomy outcomes in advanced glaucoma in Nigeria
Duplicate
Other (specify):does not state that these are POAG
OAG can’t be analyzed separately
• "Andermann, C., Mialhe, D., and Arne, J. L. Ocular hypotensive effects of a new long acting pilocarpine salt. Clinical results by repeated administration:
Foreign language
Foreign language
• "Anderson, D. R., Drance, S. M., and Schulzer, M. Factors that predict the benefit of lowering intraocular pressure in normal tension glaucoma
Medical KQ 3 or KQ 3 and KQ 6 only
• "Andreasson, D., Georgopoulos, G. T., Vergados, J., Papaconstantinou, D., Liokis, N., and Theodossiadis, P. Clinical evaluation of the effect of mitomycin-C in re-operation for primary open angle glaucoma
Included in Wilkins 2010
Other (specify):Pindolol not an intervention of interest
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
It is not a RCT and has less than 100 patients
OAG can’t be analyzed separately
• "Ang, G. S., Kersey, J. P., Shepstone, L., and Broadway, D. C. The effect of travoprost on daytime intraocular pressure in normal tension glaucoma: a randomised controlled trial
Unique comparators
• "Angelo-Nielsen, K. Timolol topicaly and diabetes mellitus. JAMA 80 ; 244 (20): 2263 .
It is a case series
• "Anghel, G. and Anghel, A. C. [Opinions about quality of life in glaucoma patients with medications in Romania]
Foreign language
• "Anglade, E. and Dreyer, E. THE EFFECT OF MITOMYCIN C AND 5-FLUOROURACIL ON CORNEAL ENDOTHELIUM IN TRABECULECTOMY SURGERY
Meeting abstract


Does not address any key questions


No original data (e.g., systematic review, narrative review, editorial, letter), No subjects with open-angle glaucoma

"Antohi I, Chiseliţă, D, Cionca D, Gherman C, Moşoci I, and Gentimir M. [The role of iridectomy in glaucoma surgery] Foreign language

"Antohi, I., Chiseliță, D., Cionca, D., Gherman, C., Motoc, I., and Gentimir, M. [The role of iridectomy in glaucoma surgery] Foreign language


Data not abstractable


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

"Araie, M. A three-year comparative, prospective and randomized study between 0.005% Latanoprost and 0.5% Timolol in Japanese Normal Tension Glaucoma patients

Meeting abstract

"Araie, M., Azuma, I., and Kitazawa, Y. Influence of topical betaxolol and timolol on visual field in japanese open-angle glaucoma (oag) patients

Meeting abstract

"Araie, M., Azuma, I., and Kitazawa, Y. Influence of topical betaxolol and timolol on visual field in Japanese open-angle glaucoma patients

Medical KQ 3 or KQ 3 and KQ 6 only


It is not a RCT and has less than 100 patients


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


OAG can’t be analyzed separately


Data not abstractable


Data not abstractable

"Arcieri, E. S., Arcieri, R. S., Pereira, A. C., Andreo, E. G., Finotti, I. G., and Sa Filho, W. F. Comparing the fixed combination brimonidine-timolol versus fixed combination dorzolamide-timolol in patients with elevated intraocular pressure

Medical KQ 3 or KQ 3 and KQ 6 only

"Arcieri, E. S., Pereira, A. C. A., Andreo, E. G. V., Finotti, I. G. A., Arcieri, R. S., and Sa Filho, W. F. Fixed Combination Brimonidine-Timolol (Combigan®) versus Fixed Combination Dorzolamide-Timolol (Cosopt®) Each Given Twice Daily to Reduce Intraocular Pressure in Subjects With Open Angle Glaucoma or Ocular Hypertension

Meeting abstract
• "Arcieri, E. S., Pierre Filho, P. T., Wakamatsu, T. H., and Costa, V. P. The effects of prostaglandin analogues on the blood aqueous barrier and corneal thickness of phakic patients with primary open-angle glaucoma and ocular hypertension

Medical KQ 3 or KQ 3 and KQ 6 only

• "Ardjomand, N., Ardjomand, N., and Komericki, P. Efficacy of timolol hydrogel 0.1% in patients with primary open angle glaucoma and ocular hypertension: Wirkung von timolol hydrogel 0.1% bei patienten mit primarem offenwinkelglaukom und okularer hypertension

Foreign language

• "Arend, O. and Raber, T. Observational study results in glaucoma patients undergoing a regimen replacement to fixed combination travoprost 0.004%/timolol 0.5% in Germany. J Ocul Pharmacol Ther 2008 ;24 (4): 414-20.

OAG can't be analyzed separately

• "Arend, O., Harris, A., Remky, A., Wenzel, M., and Redbrake, C. [Dorzolamide and retinal microcirculation in glaucoma with normal intraocular pressure]

Meeting abstract

• "Arend, O., Kaup, M., Plange, N., Remky, A., and Redbrake, C. [The intraocular pressure reducing effect by modification of non-penetrating sclerectomy with viscocanalostomy by a combination with amnion-implant and/or 5-Fluorouracil application in patients with glaucoma]

Meeting abstract

• "Arend, O., Plange, N., Remky, A., and Redbrake, C. Influence on Intraocular Pressure Following Deep Non Pentrating Sclerectomy and Viscocanalostomy in Combination With Amnion Implant and/or 5 Fluorouracil Application in Glaucoma Patients

Meeting abstract

• "Arend, O., Wolter, P., Huber, K., Harris, A., and Remky, A. Retinal Circulation after Timolol, Latanoprost or Dorzolamide Application in Newly Diagnosed Glaucoma Patients

Meeting abstract

• "Arias-Puente, A., Batuelos, J., Garcia-Saenz, C., Ragai-Kamel, N., and Gili, P. EFFICACY OF DEEP NON-PENETRATING SCLERECTOMY IN THE SURGICAL TREATMENT OF PRIMARY OPEN ANGLE GLAUCOMA

Meeting abstract


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Arieta, Carlos Eduardo Leite, Barbosa, Katia Borgia, Rocha, Eduardo Melani, Castro, Rosane Silvestre de, and Jose, Newton Kara. Pilocarpina a 2 por cento na prevencåo da elevagåo da pressåo intra-ocular pela aplicåo de Neodinium Yag Laser em capsulostomia posterior

Foreign language


It is not a RCT and has less than 100 patients


It is combined cataract/glaucoma surgery study published before April 2000


It is not a RCT and has less than 100 patients

• "Arrata, M., Massin, M., and Sfeir, T. [A single dose of maleate of timolol given orally: the effect on the ocular pressure (author's transl)]

Foreign language


It is a case series

• "Artigas, Alejandro. Implantes de drenaje en Glaucoma

Foreign language


It is not a RCT and has less than 100 patients. Data not abstractable


It is a case series

It is a case series


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Data not abstractable


Does not address any key questions


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


No original data (e.g., systematic review, narrative review, editorial, letter)


OAG can’t be analyzed separately


Other (specify):not FDA approved"
It is not a RCT and has less than 100 patients

- "Bacharach, J., Varma, R., Schenker, H., Caprioli, J., Liu, C. C., and Batoosingh, A. L. Masked, Randomized, Parallel Comparison of IOP-Lowering Efficacy after Switching to Bimatoprost 0.03% vs Continuing with Latanoprost 0.005% Meeting abstract

OAG can’t be analyzed separately


Data not abstractable


Does not address any key questions

- "Bagli, E., Gartzios, C., Asproudis, I., and Kitsos, G. Comparison of one-site versus two-site phacotrabeceuctomy without the use of antimetabolites intraoperatively in patients with pseudoxefoliation glaucoma and primary open-angle glaucoma Included in Gdih 2011

Unique comparators

- "Bakutkin, V. V. and Saprykin, P. I. [The efficacy of optimized sinusotrabecuclcteromy in primary open-angle glaucoma based on the late results data]. Ophthalm Zh 90 ;(7): 414-6.

Does not address any key questions

- "Balazsi, A. G., Saheb, N. E., Kasner, O. P., Overbury, O., and Faubert, J. THE EFFECTS OF TIMOLOL MALEATE ON STATIC VISUAL FIELDS, TEMPORAL MODULATION FIELDS, AND SPATIAL CONTRAST SENSITIVITY IN EARLY GLAUCOMA Meeting abstract

Does not address any key questions

- "Bansal, A. and Ramanathan, U. S. Sudden lowering of intraocular pressure may cause retinal bleeding by three different mechanisms. Br J Ophthalmol 2008 ;92 (8): 1158-9. No original data (e.g., systematic review, narrative review, editorial, letter)
- "Barad, P., Carlson, D. W., and Alward, W. L. A RANDOMIZED STUDY OF MITOMYCIN AUGMENTATION IN COMBINED PHACOEMULSIFICATION AND TRABECULECTOMY Meeting abstract
- "Barber, B. L. and Santanello, N. C. Relating spontaneous adverse experience reports to scores on a questionnaire querying tolerability Excluded drug

Other (specify): Not a RCT

- "Barnebey, H. LONG-TERM EFFICACY OF BRIMONIDINE ON IOP LOWERING Meeting abstract
- "Barnebey, H. S., Pettigrew, S. C, Mallick, S., Andrew, R. M, Sullivan, E. K., Wells, D. T, Landry, T. A., Bergamini, M. V W, Robertson, S. M, and Travoprost 0.004%/Timolol 0.5% Study Group. Three Month Comparison of the Safety and Efficacy of Travoprost 0.004%/Timolol 0.5% Ophthalmic Solution to TRAVATAN® and Timolol 0.5% Meeting abstract
- "Barnebey, H. S., Mallick, S., Andrew, R. M., Wells, D. T., Landry, T. A., and Bergamini, M. V. W. Six Week Comparison Safety and Efficacy of Travoprost 0.004%/Timolol 0.5% Ophthalmic Solution to TRAVATAN® and Timolol 0.5% Meeting abstract
- "Barnebey, H. S., Orengo-Nania, S., Flowers, B. E., Samples, J., Mallick, S., Landry, T. A., and Bergamini, M. V. The safety and efficacy of
travoprost 0.004%/timolol 0.5% fixed combination ophthalmic solution.

Does not address any key questions

- "Barnebey, H., Mallick, S., Andrew, R. M., Wells, D., Landry, T. A., Bergamini, M. V. A., Wax, M. B., and Robertson, S. M. Efficacy of Extravan (Travoprost 0.004%/Timolol 0.5% Ophthalmic Solution) Compared to Either Travatan or Timolol 0.5% Alone

Meeting abstract


Data not abstractable

- "Barnes, R. M., Mora, J. S., and Best, S. J. Beta radiation as an adjunct to low-risk trabeculectomy
Kirwan 2009

- "Barnes, S. D., Campagna, J. A., Dirks, M. S., and Doe, E. A. Control of intraocular pressure elevations after argon laser trabeculoplasty: comparison of brimonidine 0.2% to apraclonidine 1.0%. Ophthalmology 99 ;106 (10): 2033-7.

Does not address any key questions

- "Barnes, S. D., Dirks, M. S., Doe, E. A., Campagna, J. A., and Zimmerman, T. CONTROL OF INTRAOCULAR PRESSURE SPIKES AFTER ARGON LASER TRABECULOPLASTY: BRIMONIDINE 0.2% VS. APRACLONIDINE 1.0%
Meeting abstract

Systematic review

- "Barraquer, C. Double-blind trial of timolol against pilocarpine in glaucoma: ESTUDIO DOBLE CIEGO TIMOLOL-PILOCARPINA
Foreign language

- "Barreiro, Jefferson, Pereira, Telma, Lima, Wagner Loduca, and Assis, Carlos Augusto Moya. Alterações oculares após capsulotomia posterior com nd: yag laser: estudo comparativo com e sem uso de col/Eríos timolol 0, 5: e dexametasona 0, 1
Foreign language

- "Barretto, Caroline Amorim, RWgo, Patr/Ecia, Santos, Rodrigo Almeida Vieira, Toscano, Daniela, Brandt, Carlos Teixeira, and Dantas, Ronaldo Rodrigues. FungPo pulmonar em portadores de esquistossomose mansônica hepatoesplênica, usuários de col/Eríos timolol a 0,5por cento
Foreign language

- "Barrisban4flaxCraven, E. R., Sherwood, M. B., and DuBiner, H. B. Twelve-Month Randomized Comparison of Fixed Combination Brimonidine 0.2%/Timolol 0.5% With Each Component as Monotherapy
Meeting abstract

- "Bartkowska-Orlowska, M. and Pecoldowa, K. [Experiences with timolol use in cases of glaucoma (author's transl)]
Foreign language

- "Bartlett, J. D. and Evans, D. W. Contrast Sensitivity Improvements in Brimonidine-Treated Primary Open-Angle Glaucoma Patients Suggest a Neuroprotective Mechanism
Meeting abstract


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

- "Bartlett, J., Olivier, M., Richardson, T., Whitaker, R., Greenidge, K., and Pensy, D. CENTRAL NERVOUS SYSTEM EFFECTS OF CARTEOLOL HYDROCHLORIDE AND TIMOLOL MALEATE IN BLACK WOMEN
Meeting abstract

- "Bartlett, J., Than, T., and Bergamini, M. EFFICACY AND SAFETY OF TRAVOPROST COMPARED TO LATANOPROST AND TIMOLOL IN PATIENTS WITH OPEN-ANGLE GLAUCOMA (OAG) OR OCULAR HYPERTENSION (OH)
Meeting abstract


OAG can’t be analyzed separately


Does not address any key questions

Meeting abstract


- OAG can’t be analyzed separately


  OAG can’t be analyzed separately


  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


  Does not address any key questions


  Does not address any key questions


  Does not address any key questions


  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

- "Battista, R., Yan, D. B., and DBYAN Medicine Professional Corporation. Comparison of 24-Hour Post-Dose Efficacy of Travoprost and Latanoprost When Morning-Dosed in Open-Angle Glaucoma Meeting abstract


  It is not a RCT and has less than 100 patients

- "Baudouin, C., Rouland, J. F., Nordmann, J. P., Bron, A., and Pelen, F. [Efficacy of first- or second-line latanoprost on intraocular pressure and ocular symptoms in patients with open-angle glaucoma or ocular hypertension]

  Foreign language

- "Baumert, S., Pillunat, L. E., Meitinger, C., and Lang, G. K. EFFECT OF LASER TRABECULOPLASTY AND TRABECULECTOMY ON OCULAR HEMODYNAMICS IN PRIMARY OPEN ANGLE GLAUCOMA Meeting abstract


  Data not abstractable


  Other (specify): Control group is not an intervention of interest


  It is a case series


  Data not abstractable

- "Bazarov, K. h. B. [Effectiveness of trabeculectomy]

  Foreign language


  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


  It is a case series

**Does not address any key questions**

• "Bec, P., Arne, J. L., Secheyron, P., Fontan, P., and Mialhe, J. P. [Our experience with timolol in the treatment of open-angle glaucoma]

**Foreign language**

• "Bechetoille, A. [When and how should one operate on primary open-angle glaucoma?]. Annee Ther Clin Ophthalmol  86 ;37 : 255-64 .

**No original data (e.g., systematic review, narrative review, editorial, letter)**

• "Bechetoille, A., Denis, P., Nordmann, J. P., Sellem, E., and Valtot, F. [Chronic open-angle glaucoma]

**Foreign language**


**It is a case series**


**Other (specify):unable to abstract OAG; good PRO”


**Duplicate**

• "Beehler, C. C., Stewart, W. C., Macdonald, D. K., Croyle, T. A., Ostrov, C. S., Rosanelli, E. G., Crandall, A. S., Iacono, T. L., Lue, J. C., and Kelley, E. P. A Comparison of the Ocular Hypotensive Efficacy of Twice-Daily 0.25% Levobunolol to 0.5% Timolol in Patients Previously Treated with 0.5% Timolol

**Medical KQ 3 or KQ 3 and KQ 6 only**

• "Behrens-Baumann, W., Kimmich, F., Walt, J. G., and Lue, J. A comparison of the ocular hypotensive efficacy and systemic safety of 0.5% levobunolol and 2% carteolol

**Unique comparators**


**It is combined cataract/glaucoma surgery study published before April 2000**


**It is combined cataract/glaucoma surgery study published before April 2000**


**It is a case series**


**It is a case series**


**It is a case series**


**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**


**Does not address any key questions**

• "Bengtsson, B. and Heijl, A. Lack of long-term drift in timolol's effectiveness in patients with ocular hypertension

**Medical KQ 3 only**

• "Bensinger, R. E., Keates, E. U., Gofman, J. D., Novack, G. D., and Duzman, E. Levobunolol. A three-month efficacy study in the treatment of glaucoma and ocular hypertension

**Medical KQ 3 or KQ 3 and KQ 6 only**

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Data not abstractable

- "Bergea, B., Bodin, L., and Svedbergh, B. Impact of intraocular pressure regulation on visual fields in open-angle glaucoma

Excluded drug


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Does not address any key questions


Does not address any key questions


No original data (e.g., systematic review, narrative review, editorial, letter)

- "Bergstrand, I. C., Heijl, A., and Harris, A. Dorzolamide and ocular blood flow in previously untreated glaucoma patients: a controlled double-masked study

Medical KQ 3 or KQ 3 and KQ 6 only


No original data (e.g., systematic review, narrative review, editorial, letter)


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is not a RCT and has less than 100 patients


It is a case series

- "Best, U. P., Domack, H., and Schmidt, V. [Pressure reduction after selective laser trabeculoplasty with two different laser systems and after argon laser trabeculoplasty--a controlled prospective clinical trial on 284 eyes]

Foreign language

- "Beuerle, S., Philippin, H., and Funk, J. [Combined cataract and glaucoma surgery. Trabeculectomy vs Erb:YAG goniotomy]"
Meeting abstract

- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
- Other (specify): Assessment of statistical method not effectiveness

Systematic review

- Other (specify): Adherence rate

Does not address any key questions

- "Bias, M. F., Barad, J. P., Carlson, D. W., and Alward, W. L. M. THREE YEAR FOLLOW-UP OF MITOMYCIN VS. PLACEBO IN COMBINED PHACOEMULSIFICATION AND TRABECULECTOMY

Foreign language


Medical KQ 3 or KQ 6 only

- "Bischoff, P. Experiences with Timolol in treatment of glaucoma: ERFAHRUNGEN MIT TIMOLOL IN DER GLAUKOMTHERAPIE Duplicate"
- Other (specify): No control

Does not address any key questions


It is a case series


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Bleckenmann, H. and Dorow, P. Therapeutic consequences of glaucoma treatment with different beta-blockers in patients with obstructive respiratory tract disease: THERAPEUTISCHE KONSEQUENZ EINER GLAUKOMBEHANDLUNG MIT UNTERSCHIEDLICHEN BETABLOCKERN BEI PATIENTEN MIT OBSTRUKTIVER ATEMWEGSERKRANKUNG foreign language

unique comparators

"Blika, S. and Saunte, E. Timolol maleate in the treatment of glaucoma simplex and glaucoma capsulare. A three-year follow up study

unique comparators


Other (specify):Study design does not match KQ (KQ3)


Data not abstractable


Other (specify):Not an intervention of interest


It is not a RCT and has less than 100 patients


No original data (e.g., systematic review, narrative review, editorial, letter)


It is a case series


It is combined cataract/glaucoma surgery study published before April 2000

"Bluestein, E. and Stewart, W. TIGHT VERSUS LOOSE SCLERAL FLAP SUTURE CLOSURE IN TRABECULECTOMY SURGERY Meeting abstract


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
  It is a case series
• "Blyth, C. P. J., Moriarty, A. P., and McHugh, J. D. A. Diode laser trabeculoplasty versus argon laser trabeculoplasty in the control of primary open angle glaucoma
  Rolim de Moura 2009
  It is combined cataract/glaucoma surgery study published before April 2000
• "Bobrow, J. C. Prospective intrapatient comparison of extracapsular cataract extraction and lens implantation with and without trabeculectomy. Am J Ophthalmol 2000;
  It is combined cataract/glaucoma surgery study published before April 2000
• "Boger III, W. P., Steinert, R., Puliafito, C., and Langston p., D. Long-term experience with timolol ophthalmic solution in patients with open-angle glaucoma
  Letter to the editor
  Other (specify): pilocarpine
• "Boger, W. P. 3rd, Steinert, R. F., Puliafito, C. A., and Pavan-Langston, D. Clinical trial comparing timolol ophthalmic solution to pilocarpine in open-angle glaucoma
  Excluded drug
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Medical KQ 3 only
  Other (specify): Not a drug currently used"
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Data not abstractable
• "Bonanomi, M. T, Sunaga, A. H, and Suzanna J Junior, R. Cirurgia filtrante no glaucoma agudo primario. Resultados cirurgicos
  Foreign language
• "Bonomi, L., Marchini, G., de Franco, I., and Perfetti, S. Prospective study of the lens changes after trabeculectomy. Dev Ophthalmol 89 ;17 : 97-100
  It is not a RCT and has less than 100 patients
  Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Boozman, F. W. 3rd, Carriker, R., Foerster, R., Allen, R. C., Novack, G. D., and Batooasinh, A. L. Long-term evaluation of 0.25% levobunolol and timolol for therapy for elevated intraocular pressure

Unique comparators
• "Borggrefe, J., Grehn, F., and Lieb, W. E. COMBINED CATARACT - GLAUCOMA SURGERY: A PROSPECTIVE RANDOMIZED COMPARISON OF TWO TECHNIQUES

Meeting abstract

It is combined cataract/glaucoma surgery study published before April 2000

Short term follow up only (less than 1 month for medical study / 1 year for surgical study) but it is not a 24 hour study

It is a case series
• "Bourgeois, H. [Epidemiologic and tonometric results of a multicenter study of 5,872 patients with ocular hypertension or open-angle glaucoma treated with betaxolol]

Foreign language
• "Bourgeois, H. Results of a large epidemiological multicenter study conducted on 5,872 patients with intraocular hypertension or open angle chronic glaucoma and treated with betaxolol:

Foreign language
• "Bournias, T. and Lai, J. Comparison of Brimonidine Purite 0.15% vs. Dorzolamide 2% and Brinzolamide 1 % as Adjunctive Therapy to Hypotensive Lipids

Meeting abstract
• "Bournias, T. E and Abraham, C. Pressure-Lowering Efficacy of Bimatoprost and Latanoprost: Effect of Baseline Mean Diurnal IOP

Meeting abstract
• "Bournias, T. E. and Lai, J. Brimonidine tartrate 0.15%, dorzolamide hydrochloride 2%, and brinzolamide 1% compared as adjunctive therapy to prostaglandin analogs

Medical KQ 3 only

Other (specify): study design does not match KQ (KQ 3)
• "Boyle, J. E., Ghosh, K., Gieser, D. K., and Adamsons, I. A. A randomized trial comparing the dorzolamide-timolol combination given twice daily to monotherapy with timolol and dorzolamide

Medical KQ 3 or KQ 3 and KQ 6 only
• "Boyle, J. E., Ghosh, K., Gieser, D. K., and Adamsons, I. A. A randomized trial comparing the dorzolamide-timolol combination given twice daily to monotherapy with timolol and dorzolamide. Dorzolamide-Timolol Study Group

Medical KQ 3 or KQ 3 and KQ 6 only
• "Boyle, J., Connor, J., Polis, A., and Adamsons, I. THE LONG-TERM SAFETY OF TRUSOPT AS MONOTHERAPY AND ADJUNCTIVE THERAPY WITH TIMOLOL AND/OR PILOCARPINE

Meeting abstract
• "Boyle, J., Reines, S., Strohmaier, K., Snyder, E., and Adamsons, I. A CLINICAL TRIAL COMPARING PATIENT PREFERENCE AND IMPACT ON DAILY LIFE OF TRUSOPT AND PILOCARPINE

Meeting abstract

It is a case series
• "Brancato, R., Carassa, F., and Trabucchi, G. DIODE vs. ARGON LASER TRABECULOPLASTY: A CONTROLLED CLINICAL TRIAL

Meeting abstract
• "Brancato, R., Carassa, R., and Trabucchi, G. Diode laser compared with argon laser for trabeculoplasty

Rolim de Moura 2009
• "Brancato, R., Menchini, U., Pece, A., Bandello, F., Serini, P., and Fantaguzzi, S. [Laser trabeculoplasty: argon laser or krypton laser?]

Foreign language
• "Brandt, J. D. Phase III, 3-Month Comparison of Timolol with AGN-192024: A New Ocular Hypotensive Lipid (HTL) for Glaucoma Management
  Meeting abstract
  OAG can’t be analyzed separately
• "Brandt, J. D., VanDenburgh, A. M., Chen, K., and Whitcup, S. M. Comparison of once- or twice-daily bimatoprost with twice-daily timolol in patients with elevated IOP: a 3-month clinical trial
  Medical KQ 3 or KQ 3 and KQ 6 only
  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
  Foreign language
  It is not a RCT and has less than 100 patients. Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
  Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Breusgem, C., Spielberg, L., Van Ginderdeuren, R., Vandewalle, E., Renier, C., Van de Veire, S., Fieuws, S., Zeyen, T., and Stalmans, I. Preoperative nonsteroidal anti-inflammatory drug or steroid and outcomes after trabeculectomy: a randomized controlled trial
  Systematic review
• "Briggs, M. C. and Jay, J. L. Age over 46 years does not affect the pressure lowering effect of trabeculectomy in primary open angle glaucoma. Br J Ophthalmol 99;83 (3): 280-4.
  It is a case series
  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
  Data not abstractable
  No original data (e.g., systematic review, narrative review, editorial, letter)
  It is a case series
• "Brittain, C. J., Saxena, R., and Waldock, A. Prospective comparative switch study from timolol 0.5% and latanoprost 0.005% to bimatoprost 0.03%. Adv Ther 2006;23 (1): 68-73.
  Animal or in vitro data
• "Brittain, C. J., Saxena, R., and Waldock, A. Prospective comparative switch study from timolol 0.5% and latanoprost 0.005% to bimatoprost 0.03%. Adv Ther 2006;23 (1): 68-73.
  Does not address any key questions
  Does not address any key questions
  Other (specify): Mean age under 50

OAG can't be analyzed separately

Data not abstractable
• "Broadway, D. C., Salmon, J., Migdal, C. S., Franks, W. A., Barton, K., and Khaw, P. T. ADJUNCTIVE ANTI-TGFß2 HUMAN MONOCLONAL ANTIBODY AS A NOVEL AGENT TO PREVENT SCARRING FOLLOWING PHACOTRABECULECTOMY Meeting abstract

No original data (e.g., systematic review, narrative review, editorial, letter)
• "Broadway, D., Grierson, I., and Hitchings, R. Racial differences in the results of glaucoma filtration surgery: are racial differences in the conjunctival cell profile important?. Br J Ophthalmol 94 ;78 (6): 466-75.

It is not a RCT and has less than 100 patients

It is a case series

Other (specify):kq 1 and 3 other trial
• "Bron, A. [Comparison of latanoprost monotherapy with timolol-dorzolamide combination in patients with open-angle glaucoma or ocular hypertension]

Foreign language

Does not address any key questions
• "Bron, A., Chiambaretta, F., Pouliquen, P., Rigal, D., and Rouland, J. F. Efficacy and safety of substituting a twice-daily regimen of timolol with a single daily instillation of nonpreserved beta-blocker in patients with chronic glaucoma or ocular hypertension]

Foreign language
• "Bron, A., Chiambaretta, F., Pouliquen, P., Rigal, D., and Rouland, J.-F. Efficacy and safety of substituting a twice-daily regimen of timolol with a single daily instillation of nonpreserved beta-blocker in patients with chronic glaucoma or ocular hypertension: Intereat de la substitution d'un traitement journalier de 2 instillations de timolol par 1 instillation quotidienne de betabloquant non conserve chez des patients presentant un glaucome chronique ou une hypertonic oculaire Duplicate"

Foreign language

Foreign language

Foreign language
• "Bron, A., Annonier, P., Gerhard, J. P., Flamant, J., and Simony, N. Late results of trabeculectomy in chronic simple glaucoma. Apropos of
the operations performed at the Ophthalmologic Clinic of Strasbourg from 1975 to 1981.

Foreign language

Data not abstractable

Data not abstractable

OAG can’t be analyzed separately

It is a case series

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Meeting abstract
• "Bryant, J. Laser trabecuoplasty as primary therapy for glaucoma (Structured abstract)

Abstract only
• "Bucci, M. G. Intraocular pressure-lowering effects of latanoprost monotherapy versus latanoprost or pilocarpine in combination with timolol: a randomized, observer-masked multicenter study in patients with open-angle glaucoma. Italian Latanoprost Study Group

Excluded drug

Other (specify): No control

Does not address any key questions
• "Bucci, M. G., Quaranta, L., Quaranta, C. A., Nascimbeni, G., Semeraro, F., Quaranta, M., Braga, O., Cassamali, M., and Manni, G. L. INVESTIGATION ON THE ADDICTIVE EFFECT OF TIMOLOL AND METIPRANOLOL

Meeting abstract

It is not a RCT and has less than 100 patients

No subjects with open-angle glaucoma
• "Budenz, D. L. A clinician's guide to the assessment and management of nonadherence in glaucoma Systematic review


No subjects with open-angle glaucoma

No subjects with open-angle glaucoma

Meeting abstract

It is not a RCT and has less than 100 patients


No original data (e.g., systematic review, narrative review, editorial, letter)

"Bunin, A. I. a., Ermakova, V. N., and Gurtovaia, E. E. [Hypersecretory glaucoma]

Foreign language


Does not address any key questions


It is a case series


No original data (e.g., systematic review, narrative review, editorial, letter)


Does not address any key questions


OAG can't be analyzed separately


Meeting abstract

"Buys, Y. M., Zack, B., Slomovic, A. R., Rootman, D. S., and Trope, G. E. Prospective Randomized Comparison of One- versus Two-Site Phacotrabeculectomy, Two Year Results

Meeting abstract

"Buzarovska, K. B., Jordanova, V. D., Vukosavljevic, M., and Dzajkovska, E. [Visual acuity after trabeculectomy]

Foreign language

"Buzek, J. [Effect of drugs, used in the conservative treatment of glaucoma, on immediate adaptation]

Foreign language

"Bylsma, S. S. Trabeculectomy with antimetabolites vs nonpenetrating deep sclerectomy with collagen implant: new randomized protocol

Meeting abstract


Other (specify): No concurrent control"


It is a case series


Meeting abstract


It is a case series


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Other (specify): pilocarpine

"Calugaru, D. and Calugaru, M. [Bimatoprost therapy in glaucoma]

Systematic review

"Calugaru, D. and Calugaru, M. [Monotherapy with lipid structural derivatives in glaucoma]

Systematic review
• "Cameli, N., Vicenzi, C., and Tosti, A. Allergic contact conjunctivitis due to timolol in eyedrops. Contact Dermatitis 91 ;25 (2): 129-30.

It is a case series


It is not a RCT and has less than 100 patients

• "Campbell, S. H., Hickey-Dwyer, M., and Harding, S. P. Double-masked three-period crossover investigation of timolol in control of raised intraocular pressure

Medical KQ 3 or KQ 3 and KQ 6 only

• "Camras, C. B and United States Latanoprost-Brimonidine Study Group. Efficacy and Safety of Latanoprost or Brimonidine in Patients with Ocular Hypertension or Primary Open Angle Glaucoma

Meeting abstract


Meeting abstract

• "Camras, C. B. and Hedman, K. Rate of response to latanoprost or timolol in patients with ocular hypertension or glaucoma

Medical KQ 3 only

• "Camras, C. B. and Sheu, W. P. Latanoprost or brimonidine as treatment for elevated intraocular pressure: multicenter trial in the United States

Medical KQ 3 only

• "Camras, C. B. and The Brinzolamid Primary Therapy Study Group. A TRIPLE-MASKED, PRIMARY THERAPY STUDY OF THE EFFICACY AND SAFETY OF BID AND TID-DOSED BRINZOLAMIDE 1% COMPARED TO TID-DOSED DORZOLAMIDE 2% AND BID-DOSED TIMOLOL 0.5%

Meeting abstract

• "Camras, C. B. and the United States Latanoprost Study Group. RATE OF RESPONSE TO LATANOPROST OR TIMOLOL IN PATIENTS WITH OCULAR HYPERTENSION OR GLAUCOMA

Meeting abstract


No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)

• "Camras, C. B. Comparison of latanoprost and timolol in patients with ocular hypertension and glaucoma: a six-month masked, multicenter trial in the United States. The United States Latanoprost Study Group

Medical KQ 3 or KQ 3 and KQ 6 only


Other (specify): Study design does not match KQ


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Medical KQ 3 or KQ 3 and KQ 6 only


Medical KQ 3 or KQ 3 and KQ 6 only

41 (5): 566-75.

**Does not address any key questions**

- "Cankaya, A. B., Teberik, P., and Acaroglu, G. Alterations in anterior chamber depth in primary open-angle glaucoma patients during latanoprost therapy. Acta Ophthalmol 2009; It is not a RCT and has less than 100 patients. Does not address any key questions

- "Cantor, L. B and AGN 192024 Study Groups, 1. & 2. 6-Month comparison of AGN 192024 once-daily and twice-daily with timolol twicedaily in patients with elevated IOP

**Meeting abstract**

- "Cantor, L. B, Hoop, J., Morgan, L., and Bimatoprost-Travoprost Study Group. IOP-Lowering Efficacy of Bimatoprost 0.03% and Travoprost 0.004% in Patients With Glaucoma or Ocular Hypertension

**Meeting abstract**

- "Cantor, L. B. COMPARISON OF BRIMONIDINE 0.2% VERSUS BETAXOLOL 0.25% FOR CONTROL OF INTRAOCULAR PRESSURE

**Meeting abstract**

- "Cantor, L. B., Alvi, N. P., Hoop, J. S., Katz, L. J., Flartey, K., Brizendine, E. I., and Bhavnani, V. D. COMPARISON OF ONCE DAILY LEVOBUNOLOL 0.5%. VERSUS TIMOLOL XE 0.5% FOR THE CONTROL OF INTRAOCULAR PRESSURE AND PATIENT COMFORT

**Meeting abstract**


**Meeting abstract**

- "Cantor, L. B., Hoop, J., Katz, L. J., and Flartey, K. Comparison of the clinical success and quality-of-life impact of brimonidine 0.2% and betaxolol 0.25 % suspension in patients with elevated intraocular pressure

**Medical KQ 3 only**

- "Cantor, L. B., Hoop, J., Katz, L. J., Flartey, K., and Alphagan/Betaxolol Clinical Success Study Group. Comparison of the clinical success and quality-of-life impact of brimonidine 0.2% and betaxolol 0.25% suspension in patients with elevated intraocular pressure

**Medical KQ 3 or KQ 3 and KQ 6 only**

- "Cantor, L. B., Hoop, J., Morgan, L., Wudunn, D., and Catoira, Y. Intraocular pressure-lowering efficacy of bimatoprost 0.03% and travoprost 0.004% in patients with glaucoma or ocular hypertension

**Medical KQ 3 or KQ 3 and KQ 6 only**

- "Cantor, L. B., Katz, L. J., Flartey, K. J., Spaeth, G. L., WuDunn, D., Hoop, J. S., Lakhani, V., and Alvi, N. P. COMPARISON OF THE EFFECT OF ALPHAGAN 0.2% VERSUS TRUSOPT 2.0% IN COMBINATION WITH BETA-BLOCKERS

**Meeting abstract**

- "Cantor, L. B., Liu, C. C., Batoosingh, A. L., and Hollander, D. A. Safety and tolerability of brimonidine purite 0.1% and brimonidine purite 0.15%; a meta-analysis of two phase 3 studies

**Systematic review**


**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

- "Cantor, L. B., Safyan, E., Liu, C. C., and Batoosingh, A. L. Brimonidine-purite 0.1% versus brimonidine-purite 0.15% twice daily in glaucoma or ocular hypertension: a 12-month randomized trial

**Unique comparators**

- "Cantor, L. B., WuDunn, D., Alvi, N. P., Hoop, J. S., Katz, L. J., Flartey, K., and Brizendine, E. J. COMPARISON OF TWICE DAILY BETAXOLOL 0.25% VERSUS BRIMONIDINE 0.2% FOR THE CONTROL OF INTRAOCULAR PRESSURE

**Meeting abstract**

- "Cantor, L. B., WuDunn, D., Cortes, A., Hoop, J., and Knotts, S. Ocular hypotensive efficacy of bimatoprost 0.03% and travoprost 0.004% in patients with glaucoma or ocular hypertension

**Medical KQ 3 or KQ 3 and KQ 6 only**


**OAG can’t be analyzed separately**


**OAG can’t be analyzed separately**

- "Caprioli, J. and Coleman, A. L. Intraocular pressure fluctuation a risk factor for visual field progression at low intraocular pressures in the

Does not address any key questions


No original data (e.g., systematic review, narrative review, editorial, letter)


It is not a RCT and has less than 100 patients

• "Carassa, R. G., Bettin, P., Fiori, M., and Brancato, R. Viscocanalostomy vs. trabeculectomy: evaluation of postoperative visual field evolution Meeting abstract


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Carassa, R. G., Bettin, P., Fiori, M., and Brancato, R. Viscocanalostomy versus trabeculectomy in white adults affected by open-angle glaucoma: a 2-year randomized, controlled trial Cheng 2009 and Chai 2010

• "Carassa, R. G., Bettin, P., Fiori, M., and Brancato, R. Viscocanalostomy vs Trabeculectomy.. Three Years After Meeting abstract

• "Carassa, R. G., Bettin, P., Fiori, M., Sannace, C., and Brancato, R. Viscocanalostomy vs trabeculectomy: a 12-month randomized prospective trial Meeting abstract

• "Cardascia, N., Vetruengo, M., Trabuco, T., Cantatore, F., and Sborgia, C. Effects of travoprost eye drops on intraocular pressure and pulsatile ocular blood flow: A 180-day, randomized, double-masked comparison with latanoprost eye drops in patients with open-angle glaucoma Medical KQ 3 or KQ 3 and KQ 6 only

Medical KQ 3 only


Data not abstractable


It is combined cataract/glaucoma surgery study published before April 2000

• "Carlsson, A. M., Chauhan, B. C., Lee, A. A., and Leblanc, R. P. Itraocular pressure and progression of glaucomatous visual field loss Medical KQ 3 or KQ 3 and KQ 6 only

• "Carlsson, A. M., Chauhan, B. C., Lee, A. A., and LeBlanc, R. P. The effect of brimonidine tartrate on retinal blood flow in patients with ocular hypertension Medical KQ 3 or KQ 3 and KQ 6 only

• "Carlsson, A. M., Chauhan, B. C., Lee, A. A., and Leblanc, R. P. The effect of brimonidine tartrate on retinal blood flow in patients with ocular hypertension KQ 3 and KQ 6 medical"


OAG can’t be analyzed separately

• "Carpineto, P., Ciancaglini, M., Zuppardi, E., Doronzo, E., and Mastropasqua, L. The role of the uveoscleral outflow in the management of pigmentary glaucoma: a 24-month study comparing latanoprost with timolol Medical KQ 3 only


It is not a RCT and has less than 100 patients


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

*Centofanti, M., Gregorio, A. D., Manni, G. L., Pasisi, V., and Bucci, M. G. COMPARATIVE ACUTE EFFECTS OF 0.2% BRIMONIDINE VERSUS 2% DORZOLAMIDE COMBINED TO BETA BLOCKERS IN OCULAR HYPERTENSION

Meeting abstract


Other (specify):Study design does not match KQ


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not address any key questions

*Centofanti, M., Oddone, F., Gandolfi, S., Hommer, A., Boehm, A., Tanga, L., Sangermani, C., Sportelli, V., Haustein, M., Manni, G., and Rossetti, L. Comparison of Travoprost and Bimatoprost plus timolol fixed combinations in open-angle glaucoma patients previously treated with latanoprost plus timolol fixed combination

Non-FDA-approved drug combination


Other (specify):Neither drug is fda-approved

It is a case series

• "Chagnon, A., Bonnefoy, C., Mandirac, and Ourgaud, M. [3 years' use of timolol in chronic open-angle glaucoma]

Foreign language

• "Chai, C. and Loon, S. C. Meta-analysis of viscocanalostomy versus trabeculectomy in uncontrolled glaucoma

Systematic review

• "Chakib, A., Ouarrach, N., Haloui, M., Elbelhadji, M., and Amraoui, A. [Viscocanalostomy: preliminary clinical results]

Foreign language

• "Chan, K., Testa, M., and McCluskey, P. Ocular comfort of combination glaucoma therapies: brimonidine 0.2%/timolol 0.5% compared with dorzolamide 2%/timolol 0.5%. J Ocul Pharmacol Ther 2007 ;23 (4): 372-6 .

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


OAG can't be analyzed separately


It is not a RCT and has less than 100 patients


No subjects with open-angle glaucoma


It is combined cataract/glaucoma surgery study published before April 2000


It is a case series


It is not a RCT and has less than 100 patients


OAG can't be analyzed separately


Does not address any key questions

• "Chauhan, B. C., Drance, S. M., and Douglas, G. R. The time-course of intraocular pressure in timolol-treated and untreated glaucoma suspects

Medical KQ 3 or KQ 3 and KQ 6 only

• "Chauhan, B. C., Nicolela, M. T., and Artes, P. H. Incidence and rates of visual field progression after longitudinal measured optic disc change in glaucoma

Systematic review

• "Chauhan, D. C., Carlsson, A., Lee, A., and LeBlanc, R. P. EFFECT OF BRIMONIDINE TARTRATE ON RETINAL BLOOD FLOW IN OCULAR HYPERTENSION

Meeting abstract


Meeting abstract


Data not abstractable


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Chen, H., Ge, J., Liu, X., and Lu, F. [The clinical analysis of 260 combined surgery of glaucoma and cataract]

Foreign language

• "Chen, M. J., Chou, J. C., Hsu, W. M., and Liu, J. H. The efficacy and safety of brimonidine 0.2% compared with timolol 0.5% in glaucoma: a randomized clinical trial on Taiwanese patients Medical KQ 3 or KQ 3 and KQ 6 only


• "Chen, P. P., Musch, D. C, and Niziol, L. M. The Effect of Early Post trabeculectomy Intraocular Pressure Spike in the Collaborative Initial Glaucoma Treatment Study. J Glaucoma 2010 ; Other (specify):No control group, Does not address any key questions (see below for questions), Does not address any key questions (see below for questions)"


• "Chen, T. C., Ang, R. T., Grosskreutz, C. L., Pasquale, L. R., and Fan, J. T. Brimonidine 0.2% versus apraclonidine 0.5% for prevention of intraocular pressure elevations after anterior segment laser surgery. Ophthalmology 2001 ;108 (6): 1033-8 . Does not address any key questions

• "Chen, T. C., Pasquale, L. R., Walton, D. S., and Grosskreutz, C. L. Diode laser transscleral cyclophotocoagulation. Int Ophthalmol Clin 99 ; 39 (1): 169-76 . No original data (e.g., systematic review, narrative review, editorial, letter)

• "Chen, Y. F., Yang, C. H., and Hung, P. T. A six-week, parallel, randomized, double-blind study comparing the efficacy and safety of the 0.5% timolol/2.0% MK-507 combination b.i.d. to the concomitant administration of 0.5% timolol b.i.d. and 2.0% MK-507 b.i.d. J Ocul Pharmacol Ther 2003 ;19 (5): 417-23 . Does not include treatment for open-angle glaucoma (medical, surgical or combined)


• "Cheng, J. W., Li, Y., and Wei, R. L. Systematic review of intraocular pressure-lowering effects of adjunctive medications added to latanoprost Systematic review

• "Cheng, J. W., Xi, G. L., Wei, R. L., Cai, J. P., and Li, Y. Efficacy and tolerability of latanoprost compared to dorzolamide combined with timolol in the treatment of patients with elevated intraocular pressure: a meta-analysis of randomized, controlled trials Systematic review


Does not address any key questions

• "Cherkunov, B. F., Kolesnikova, M. A., and Kunin, V. D. [Immediate and long-term results of modified trabeculectomy]

Foreign language

• "Chevrier, R. L., Assalian, A., Duperre, J., and Lesk, M. R. Apraclonidine 0.5% versus brimonidine 0.2% for the control of intraocular pressure elevation following anterior segment laser procedures. Ophthalmic Surg Lasers  99 ;30 (3): 199-204 .

Does not address any key questions


It is combined cataract/glaucoma surgery study published before April 2000


Other (specify): Unoprostone


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is a case series

• "Chihara, E., Nishida, A., Kodo, M., Yoshimura, N., Matsamura, M., Yamamoto, M., and Tsukada, T. Trabeculotomy ab externo: an alternative treatment in adult patients with primary open-angle glaucoma

Foreign language


Other (specify): Study design does not match KQ


Other (specify): Not a comparison of interest

• "Chisalita, D. and Poiata, I. [The progression of primary operated glaucoma]

Foreign language

• "Chisalita, D., Poiata, I., and Cozma, D. [Postoperative flat anterior chamber. The therapeutic approach]

Foreign language

• "Chisalita, D. Non-penetrating deep sclerectomy versus trabeculectomy in primary open-angle glaucoma surgery

Cheng 2009


Foreign language

• "Chisalita, D., Apatachioae, I., and Poiata, I. [The ocular hypotensive effect of the combination of latanoprost with dorzolamide]

Foreign language

• "Chisalita, D., Poiata, I., Tiutiuca, C., Stanciu, D., and Vancea, P. P. [Primary trabeculectomy in the surgery of primary open angle glaucoma]

Foreign language

• "Chisalita, D., Vancea, P. P., and Poiata, I. [The effect of chronic beta-blocker treatment on the evolution of primary open-angle glaucoma]

Foreign language


Foreign language

• "Cho, S. W., Kim, J. M., Park, K. H., and Choi, C. Y. Effects of brimonidine 0.2%-timolol 0.5% fixed-combination therapy for glaucoma. Jpn J Ophthalmol  2010 ; 54 (5; status =Department of Ophthalmology, Sungkyunkwan University School of Medicine, Kangbuk Samsung Hospital, Seoul, Korea.


It is not a RCT and has less than 100 patients

• "Choplin, N. and Brimonidine Study Group. VISUAL FIELD RESULTS FROM A ONE-YEAR MULTI-CENTER RANDOMIZED DOUBLE-
MASKED STUDY COMPARING BRIMONIDINE TARTRATE TO TIMOLOL MALEATE IN THE TREATMENT OF OCULAR HYPERTENSION AND GLAUCOMA

- Meeting abstract
- "Choplin, N. T. and Monroe, J. F. Surgically-induced astigmatism in combined ECCE with filtering procedures compared to ECCE alone. Ophthalmic Surg 92 ;
- 23 (2): 81-4.

It is combined cataract/glaucoma surgery study published before April 2000

- "Choplin, N. T. RESPONSE TO EPINEPHRINE IN PATIENTS FAILING TO RESPOND TO DIPIVALYL-EPINEPHRINE
- Meeting abstract
- "Choplin, N. T., Dirks, M. S., Tepedino, M., Batoosingh, A., Bernstein, P., Whitcup, S. M., and Bimatoprost/Latanoprost Study Group. Comparison of Clinically Relevant Response Rates to Bimatoprost and Latanoprost in Patients with Ocular Hypertension or Glaucoma

- Meeting abstract
- "Choplin, N. T., Ulrich, G. G., and Riffenburgh, R. H. ANALYSIS OF OBSERVED DIFFERENCES IN INDIVIDUAL RESPONSES TO METIPRANOLOL 0.3% AND TIMOLOL 0.5% IN LOWERING INTRAOCULAR PRESSURE (IOP) IN OPEN ANGLE GLAUCOMA AND OCULAR HYPERTENSION
- Meeting abstract

Does not address any key questions


It is a case series

- 19 (7): 784-787.

It is a case series


It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients

- "Christ, T. and Kessler, C. SINGLE COMBINATION OR SEPARATE SOLUTIONS IN GLAUCOMA TREATMENT ?
- Meeting abstract
- "Christ, T. Glaucoma-combined therapy: KOMBINATIONSTHERAPIE DES GLAUKOMS. SPEKTRUM AUGENHEILKD. 94 ;

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

- "Christakis, C. and Mangouritsas, N. Comparative studies of the pressure-lowering effect of timolol and phospholine iodide: VERGLEICHSUNTERSUCHUNGEN MIT TIMOLOL UND PHOSPHOLINE-JODID BEI APHAKIEGLAUKOM

- Duplicate 

- 137 (2): 294-300.

It is not a RCT and has less than 100 patients
- "Chung, P. Y., Schuman, J. S., Netland, P. A., Lloyd-Muhammad, R. A.,
and Jacobs, D. S. Five-year results of a randomized, prospective, clinical
trial of diode vs argon laser trabecuoplasty for open-angle glaucoma
- Rolim de Moura 2009
- "Churkin, V. E., Abramov, V. G., and Vakurin, E. A. [Longitudinal
observations of patients with open-angle glaucoma following
trabeculectomy]
- Foreign language
- "Ciancaglini, M., Carpineto, P., Agnifili, L., Nubile, M., Fasanella, V.,
Mattice, P. A., and Mastropasqua, L. Conjunctival characteristics in
primary open-angle glaucoma and modifications induced by
trabeculectomy with mitomycin C: an in vivo confocal microscopy study.
Br J Ophthalmol 2009 ;
  93 (9): 1204-9.
  It is not a RCT and has less than 100 patients
- "Ciancaglini, M., Carpineto, P., Agnifili, L., Nubile, M., Toto, L., and
Mastropasqua, L. A 12-week study evaluating the efficacy of bimatoprost
0.03% in patients with pseudoexfoliative and open-angle glaucoma. Eur J
Ophthalmol 2009 ;
  It is not a RCT and has less than 100 patients
- "Cicci, R., Frezzotti, P., Nuti, A., Traversi, C., and Frezzotti, R.
ADDITIVITY OF LATANOPROST AND PILOCARpine TO
TIMOLOL IN POAG PATIENTS
- Meeting abstract
- "Cicci, S., Di Pace, F., Casuccio, A., and Lodato, G. Deep sclerectomy
versus punch trabeculectomy: effect of low-dosage mitomycin C
- Cheng 2009
- "Cicci, S., Di Pace, F., Casuccio, A., Calvaruso, L., Morreale, D.,
Vadala, M., and Lodato, G. Deep sclerectomy versus punch
trabeculectomy with or without phacoemulsification: a randomized
clinical trial
- Chang 2010
- "Cicci, S., Di Pace, F., Casuccio, A., Cicci, G., and Lodato, G. Deep
sclerectomy versus trabeculectomy with low-dosage mitomycin C: four-
year follow-up
- Cheng 2009
- "Cicci, S., Zeppa, F., Casuccio, A., Morreale, D., Bocchetta,
F., and Lodato, G. E-PTFE (Gore-Tex) implant with or without low-
dosage mitomycin-C as an adjuvant in penetrating glaucoma surgery: 2
year randomized clinical trial
- Duplicate of 7849 "
- "Cimino, L. and Gandolfi, S. A. DEEP SCLERECTOMY WITHOUT
ABSORBABLE IMPLANT AND WITH UNSUTURED SUPERFICIAL
FLAP: PROSPECTIVE RANDOMIZED CLINICAL - TRIAL vs.
TRABECULECTOMY WITH RELEASABLE SUTURES
- Meeting abstract
- "Cinotti, A., Cinotti, D., Grant, W., Jacobs, I., Galin, M., Silverstone, D.,
Shin, D., Esters, J., Lee, J., Bouchez, R., and et, a. l. Levobunolol vs
timolol for open-angle glaucoma and ocular hypertension
- Medical KQ 3 or KQ 3 and KQ 6 only
laser trabeculoplasty. J Glaucoma 2004 ;
  No original data (e.g., systematic review, narrative review, editorial,
letter)
W. E. A comparison of the efficacy of betaxolol and timolol in ocular
hypertension with or without adrenaline. Aust N Z J Ophthalmol 89 ;
  Short term follow up only (less than 1 month for medical study/1 year
for surgical study) but it is not a 24 hour study
- "Clearkin, L. Adverse effects of topical antiglaucoma medication. Arch
Ophthalmol 95 ;113 (7): 849-50.
- No original data (e.g., systematic review, narrative review, editorial,
letter)
- "Clearkin, L. Deep anterior lamellar keratoplasty: a new approach for
the management of pterygium in keratoconus. Arch Ophthalmol 122 ;
  No original data (e.g., systematic review, narrative review, editorial,
letter)
- "Clergeau, G. and Pechereau, A. [Value of timoptol in primary open-angle
glaucoma patients over 60. Comments on 100 cases
- Foreign language
- "Clineschmidt, C. M. and Shedden, A. H. THREE MONTH, PARALLEL,
RANDOMIZED, DOUBLE-MASKED, PLACEBOCONTROLLED,
MULTICENTER STUDY OF THE EFFECT OF ADDING TRUSOPT®
TO 0.5% TIMOPTIC-XETM IN PATIENTS WITH ELEVATED IOP
- Meeting abstract
• "Clineschmidt, C. M., Snyder, E., and Adamsons, I. A Randomized Trial Comparing the Dorzolamide/Timolol Combination to Monotherapy with Timolol or Dorzolamide In Patients Inadequately Controlled on Timolol Alone
  • Meeting abstract
• "Clineschmidt, C. M., Strahlman, J. R., Anderson, K., and the Timolol/Mk 07 Combination Study Group. COMPARISON OF A FIXED COMBINATION OF DORZOLAMIDE AND TIMOLOL (BID) TO CONCOMITANT ADMINISTRATION OF DORZOLAMIDE (TID) PLUS TIMOLOL (BID) IN PATENTS WITH OPEN-ANGLE GLAUCOMA FOR THREE MONTHS
  • Meeting abstract
• "Clineschmidt, C. M., Williams, R. D., Snyder, E., and Adamsons, I. A. A randomized trial in patients inadequately controlled with timolol alone comparing the dorzolamide-timolol combination to monotherapy with timolol or dorzolamide
  • Medical KQ 3 or KQ 3 and KQ 6 only
   • Medical KQ 3 or KQ 3 and KQ 6 only
• "Cohen, J. S., Gross, R. L., Cheetham, J. K., VanDenburgh, A. M., Bernstein, P., and Whitcup, S. M. Two-year double-masked comparison of bimatoprost with timolol in patients with glaucoma or ocular hypertension
  • Medical KQ 3 or KQ 3 and KQ 6 only
  • OAG can’t be analyzed separately
• "Cohen, J. S., Novack, G. D., and Zink, J. M. Intraocular pressure and visual field damage as risk factors for visual field progression in filtering surgery. Ophthalmic Surg Lasers Imaging 2010;
  • 41 (4): 452-8.
• Data not abstractable
• "Cohen, J., Brandt, J., Cheetham, J., Bernstein, P., and Whitcup, S. M. Comparing Bimatoprost to Timolol in Patients With Glaucoma or Ocular Hypertension: Results After Two Years
  • Meeting abstract
• "Cohen, Ralph, Almeida, Geraldo Vicente de, and Rehder, Jose Ricardo C. L. Eficiecia e seguranca do carteolol a 2 por cento no tratamento da hipertensao ocular cronica
  • Foreign language
• "Cohen, Ralph, Mandia Junior, Carmo, and Almeida, Geraldo Vicente de. Betaxolol a 0,25 por cento suspensao ionica x betaxolol a 0,5 por cento: estudo comparativo
  • Foreign language
• "Coleman, A. L, Vandenburgh, A. M, and Whitcup, S. M. A 3-month comparison of bimatoprost (a prostamide) with timolol/dorzolamide in patients with glaucoma or ocular hypertension
  • Meeting abstract
• Animal or in vitro data
  

• Data not abstractable
  

No original data (e.g., systematic review, narrative review, editorial, letter)
  

• Does not address any key questions
  
  "Collignon-Brach, J. and Weekers, R. [Timolol (author's transl)]

Foreign language
  

Data not abstractable
  
  "Collignon-Brach, J. Long-term effect of ophthalmic beta-adrenoceptor antagonists on intraocular pressure and retinal sensitivity in primary open-angle glaucoma

Vass-2007
  
  "Collignon-Brach, J. Long-term effect of topical beta-blockers on intraocular pressure and visual field sensitivity in ocular hypertension and chronic open-angle glaucoma

Vass-2007
  
  "Colvin Trucco, Ricardo. Cirugía combinada: extracapsular, implante de lente intraocular y trabeculectomía

Foreign language
  
  "Colvin Trucco, Ricardo. Cirugía combinada: facoemulsificación, lente intraocular y trabeculectomía

Foreign language
  


• Does not address any key questions (see below for questions) Does not address any key questions
  
  "Comparison of latanoprost, bimatoprost, and travoprost Medical KQ 3 or KQ 3 and KQ 6 only . Medical KQ 3 or KQ 3 and KQ 6 only

• Meeting abstract
  

Meeting abstract
  

OAG can’t be analyzed separately. Does not address any key questions
  

Other (specify): not FDA approved"
  
  "Corbel, M. [Tolerance for timolol maleate]

Foreign language
  
  "Coronel, Mariano. Diatermia transescleral en el manejo del glaucoma neovascular

Foreign language
  
  Correlagio entre os achados a biomicroscopia ultra-sônica de bolhas filtrantes com ou sem mitomicina C com a pressão intra-ocular. 1999. Foreign language


Meeting abstract
  


**Animal or in vitro data**


**Other (specify):** Includes angle-closure glaucoma


100 (5): 599-612.

**Data not abstractable**


**It is a case series**

"Costa, Vital Paulino, Soriano, Danilo Sone, and Carvalho, Celso Antonio de. Efeitos a curto prazo da apraclonidina 1 sobre a pressão intraocular de pacientes com glaucoma crônico de Gugulo aberto

**Foreign language**


**It is combined cataract/glaucoma surgery study published before April 2000**


33 (5): 477-82.

**It is not a RCT and has less than 100 patients**

"Costagliola, C., Parmeggiani, F., Antinozzi, P. P., Caccavale, A., Cotticelli, L., and Sebastiani, A. The influence of diclofenac ophthalmic solution on the intraocular pressure-lowering effect of topical 0.5% timolol and 0.005% latanoprost in primary open-angle glaucoma patients

**Excluded drug**


141 (2): 379-81.

**Does not include treatment for open-angle glaucoma (medical, surgical or combined)**

"Costagliola, C., Parmeggiani, F., Ciancaglini, M., D’Oronzo, E., Mastropasqua, L., and Sebastiani, A. Ocular perfusion pressure and visual field indice modifications induced by alpha-agonist compound (clonidine 0.125%, apraclonidine 1.0% and brimonidine 0.2%) topical administration. An acute study on primary open-angle glaucoma patients. Ophthalmologica 2003 ;

217 (1): 39-44.

**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**


246 (3): 389-96.

**Other (specify):** Applies to KQ3 but not RCT


**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

"Cotran, P. R and Roh, S. One-site vs. two-site combined phacoemulsification and trabeculectomy

**Meeting abstract**

"Cotran, P. R and Roh, S. Phacotrabeculectomy: Comparison of One-site and Two-site Surgery With 3 Year Follow-up

**Meeting abstract**
• "Cotran, P. R. and Roh, S. One-site vs. Two-site Phacotrabeculectomy: Results After One Year of Follow-up
  Meeting abstract
• "Cotran, P. R., Roh, S., and McGwin, G. Randomized comparison of 1-Site and 2-Site phacotrabeculectomy with 3-year follow-up
  Included in Gdih 2011
  Foreign language
• "Coivilir, V., Grigoras, O., Zorila, C., and Mircea, D. [Comparative results of nonpenetrante profound sclerectomy converted in trabeculectomy with standard trabeculectomy]
  Foreign language
• "Craven, E. R., Goni Francisco, G., and Chou, C. Efficacy and Safety of the IOP-Lowering Fixed Combination Brimonidine 0.2%/Timolol 0.5%
  Meeting abstract
• "Craven, E. R., Liu, C. C., Batoosingh, A., Schiffman, R. M., and Whitcup, S. M. A randomized, controlled comparison of macroscopic conjunctival hyperemia in patients treated with bimatoprost 0.01% or vehicle who were previously controlled on latanoprost. Clin Ophthalmol 2010;
  4; status =Glaucoma Consultants of Colorado, Denver, CO, USA.
  excraven@glaukdocs.com : 1433-40
  OAG can’t be analyzed separately
• "Craven, E. R., Walters, T. R., Williams, R., Chou, C., Cheetham, J. K., and Schiffman, R. Brimonidine and timolol fixed-combination therapy versus monotherapy: a 3-month randomized trial in patients with glaucoma or ocular hypertension
  Medical KQ 3 or KQ 3 and KQ 6 only
• "Crichton, A. BRIMONIDINE TARTRATE 0.2% COMPARED WITH TIMOLOL 0.5% ADMINISTERED TWICE-DAILY IN PATIENTS WITH OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION
  Meeting abstract
• "Crick, R. P., Newson, R. B., Shipley, M. J., Blackmore, H., and Bulpitt, C. J. The progress of the visual field in chronic simple glaucoma and ocular hypertension treated topically with pilocarpine or with timolol. Eye (Lond) 90;
  4 ( Pt 4) : 563-71
  Other (specify): pilocarpine
  2 (A): S12-S14
  Data not abstractable
• "Cronemberger, Sebastião, Calixto, Nassim, and Soares, Jose Francisco. Estudo comparativo do efeito do timolol, do betaxolol e do levobunolol sobre a curva díbria de pressão intra-ocular de pacientes glaucomatosos
  Foreign language
• "Cuca, R. [Filtering surgery in primary hypertensive glaucoma]
  Foreign language
• "Curran, M. P. Bimatoprost: a review of its use in open-angle glaucoma and ocular hypertension. Drugs Aging 2009;
  26 (12): 1049-71.
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Cvetkovic, D., Parunovic, A., and Kontic, D. [Conjunctival changes in long-term topical drug therapy of glaucoma]
  Foreign language
• "Cyraci, I. C., Samuel, F., Katz, L. J., and Smith, M. INFLUENCE OF SCLERAL CAUTERY ON SUCCESS OF TRABECULECTOMY
  Meeting abstract
• "Czechowicz-Janicka, K., Staszkiewicz, J., Strzalkowska, M., Krajewska, M., Popiolek, B., and Christman, A. [The influence of 0.85% RS-timolol and 0.5% S-timolol on intraocular pressure and systemic arterial blood pressure, heart rate, ECG, expiratory capacity in patients with ocular hypertension and primary open-angle glaucoma]
• Foreign language
  "Dabrowska, J. [Side effects of antiglaucomatous drugs]

• Foreign language

• It is not a RCT and has less than 100 patients

• It is not a RCT and has less than 100 patients

• Other (specify): pilocarpine
  90 (12): 1490-4.

• OAG can’t be analyzed separately

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
  "Dancheva, L. D. and Zhukova, V. N. [Remote results in the treatment of the initial stage of glaucoma with miotics]

• Foreign language
  "D'Andrea, A., D'Andrea, D., and Ferreri, G. Clinical use of a topical carbonic anhydrase inhibitor in patients affected by chronic simple glaucoma

• Medical KQ 3 or KQ 3 and KQ 6 only
  "D'Andrea, A., De Natale, R., and Mancini, A. The metipranolol 0.3% in the therapy of glaucoma

• Foreign language

• No original data (e.g., systematic review, narrative review, editorial, letter)
  "Daniesescu, C. [Management of pseudoexfoliative glaucoma in a tertiary center in Romania]

• Foreign language

• No original data (e.g., systematic review, narrative review, editorial, letter)
  "Das, J. C., Chaudhuri, Z., Sharma, P., and Bham, S. The Ahmed Glaucoma Valve in refractory glaucoma: experiences in Indian eyes. Eye (Lond) 2005 ;

• Data not abstractable

• OAG can’t be analyzed separately
  249 (4; status =Private Eye Clinic, Munich, Germany.): 565-73.

• Other (specify): Not one of our accepted surgeries
  "Das, J. C., Chaudhuri, Z., Sharma, P., and Bhoman, S. The Ahmed Glaucoma Valve in refractory glaucoma: experiences in Indian eyes. Eye (Lond) 2005 ;

• It is not a RCT and has less than 100 patients
  249 (4: status =Private Eye Clinic, Munich, Germany.): 565-73.

• Other (specify): Not one of our accepted surgeries
  249 (4; status =Private Eye Clinic, Munich, Germany.): 565-73.
• Does not address any key questions
• "Dausch, D., Michelson, W., and Lorenz, E. D. [Long-term study of the pressure-lowering effect of Timolol (author's transl)]. Klin Monbl Augenheilkd 79 ;
• 174 (1): 127-35.
• It is not a RCT and has less than 100 patients
• "David, R., Foerster, R. J., Ober, M., Cohen, J. S., Kelley, E. P., Lue, J. C., and Novack, G. D. Glaucoma treatment with once-daily levobunolol
Medical KQ 3 or KQ 3 and KQ 6 only
• 61 (11): 668-74.
• It is not a RCT and has less than 100 patients
• 22 (4): 208-11.
• Other (specify): all had pilo
• Does not address any key questions
• Does not address any key questions
• "Davidson, S. I. Systemic effects of eye drops. Trans Ophthalmol Soc UK
• 74 ;
• 94 (2): 487-95.
• No original data (e.g., systematic review, narrative review, editorial, letter)
• "Davis, A. R., Diggory, P., and Seward, H. C. Prevalence of chronic hypokalaemia amongst elderly patients using acetozolamide and diuretics. Eye (Lond) 95 ;
• 9 ( Pt 3) : 381-2.
• It is not a RCT and has less than 100 patients

C. A persistency and economic analysis of latanoprost, bimatoprost, or beta-blockers in patients with open-angle glaucoma or ocular hypertension (Structured abstract). Journal of Ocular Pharmacology and Therapeutics 2004 ;
• Does not address any key questions
• "Day, D. G. and Hollander, D. A. Brimonidine purite 0.1% versus brinzolamide 1% as adjunctive therapy to latanoprost in patients with glaucoma or ocular hypertension. Curr Med Res Opin 2008 ;
• 24 (5): 1435-42.
• OAG can’t be analyzed separately
• "Day, D. G., Schacknow, P. N., Sharpe, E. D., Ellyn, J. C., Kulze, J. C. 3rd, Threlkeld, A. B., Jones, E. D., Brown, R. H., Jenkins, J. N., and Stewart, W. C. A persistency and economic analysis of latanoprost, bimatoprost, or beta-blockers in patients with open-angle glaucoma or ocular hypertension
Unique comparators
• "Day, D. G., Schacknow, P. N., Wand, M., Sharpe, E. D., Stewart, J. A., Leech, J., and Stewart, W. C. Timolol 0.5%/dorzolamide 2% fixed combination vs timolol maleate 0.5% and unoprostone 0.15% given twice daily to patients with primary open-angle glaucoma or ocular hypertension. Am J Ophthalmol 2003 ;135 (2): 138-43.
Other (specify): unoprostone*
• Does not address any key questions
• "Day, D. G., Sharpe, E. D., Beischel, C. J., Jenkins, J. N., Stewart, J. A., and Stewart, W. C. Safety and efficacy of bimatoprost 0.03% versus timolol maleate 0.5%/dorzolamide 2% fixed combination
Unique comparators
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
an iridectomy be routinely performed as a part of trabeculectomy? Two surgeons’ clinical experience. Eye (Lond) 2009;23 (2): 362-7.

It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients

- "De Carvalho, C. A., Betinjane, A. J., Atanes, M., and Helal Jr., J. Effects of pilocarpine oculosert system on pupillary diameter, visual acuity, refraction and intra ocular pressure: EFEITOS DO SISTEMA OCUSERT PILOCARPINA (P 20 E P 40) SOBRE O DIAMETRO PUPILAR, ACUIDADE VISUAL, REFRACAO E PRESSAO INTRA OCULAR Foreign language

Does not address any key questions

- "De Grood, P. M. and Gimbrere, J. S. [Life-threatening status asthmaticus following use of timolol-containing eye drops (Timoptol)].

Foreign language

- "De Jong, L. A. Ex-PRESSTM Positioned Under a Scleral Flap, Trabeculectomy and ExPRESSTM Positioned Under Conjunctiva in Patients With Open Angle Glaucoma. A Prospective Comparison Randomized 3-Arms Study Meeting abstract
- "De Negri, Pescosolido, N., Vitangeli, M. C., and Bucci, M. G. The combination of adrenalin and oxprenolol in the treatment of glaucoma: L’ASSOCIAZIONE ADRENALINA-OXPRENOLOLO NELLA TERAPIA DEL GLAUCOMA Foreign language
- "De Popa, D. P., Andreescu, G., and Albu, C. [Tearing in a patient with glaucoma].

Foreign language

- "De Vivero, C., Lanigan, L. P, Wormald, R., Migdal, C. S, and Hitchings, R. A. Long-Term Success Rates of Trabeculectomy as Initial Therapy Compared With Trabeculectomy After Initial Medical Treatment Meeting abstract

Other (specify): case series

- "DE'Eliseo, D., Pastena, B., Longanesi, L., Grisanti, F., and Negrini, V. Comparison of deep sclerectomy with implant and combined glaucoma surgery Hondu-2008

It is not a RCT and has less than 100 patients

- "Demailly Ph., Lehner, M. A., and Etienne, R. Result of a medium-term double blind study comparing timolol maleate and epinephrine in 120 patients with chronic open angle glaucoma: RESULTAT D’UNE ETUDE A MOYEN TERME EN DOUBLE AVEUGLE COMPARANT LE MALEATE DE TIMOLOL A L’EPINEPHRINE SUR 120 PATIENTS PORTEURS D’UN GLAUCOME CHRONIQUE A ANGLE OUVERT Foreign language

Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Other (specify): not a true 24hour study


No original data (e.g., systematic review, narrative review, editorial, letter)

- "Demailly, P. h., Lehner, M. A., and Duperre, J. A new beta-blocker in the treatment of chronic open angle glaucoma, timolol maleate. The effect on
ocular tension of a single drop. UN NOUVEAU BETA-BLOQUANT
DANS LE TRAITEMENT DU GLAUCOME CHRONIQUE A ANGLE
OUVERT: LE MALEATE DE TIMOLOL. EFFET TENSIONNEL DE
L'INSTALLATION D'UNE GOUTTE

Foreign language

"Demailly, P., Allaire, C., Bron, V., and Trinquand, C. Effectiveness and
Tolerance of beta-Blocker/Pilocarpine Combination Eye Drops in
Primary Open-Angle Glaucoma and High Intraocular Pressure. J
Glaucoma 95 ;4 (4): 235-41 .

Other (specify):not FDA approved"

"Demailly, P., Aubrier, G., and Abadie, P. [Timolol and functional
perimetric prognosis of primary open-angle glaucoma]

Foreign language

"Demailly, P., Gruber, D., and Kretz, G. [Treatment of chronic primary
open-angle glaucoma. Long-term functional results]. J Fr Ophtalmol 89 ;
12 (8-9): 527-34 .

It is a case series

"Demailly, P., Jeanteur-Lunel, M. N., Berkani, M., Ecoffet, M., Kopel, J.,
Kretz, G., and Lavat, P. [Non-penetrating deep sclerectomy combined
with a collagen implant in primary open-angle glaucoma. Medium-term
retrospective results]

Foreign language

"Demailly, P., Kretz, G., and Gruber, D. [Trabeculectomy and trabeculo-
retraction in the treatment of chronic primary open-angle glaucoma. Long-

It is not a RCT and has less than 100 patients

"Demailly, P., Lavat, P., Kretz, G., and Jeanteur-Lunel, M. N. Non-
penetrating deep sclerectomy (N.P.D.S.) with or without collagen
device (C.D) in primary open-angle glaucoma: middle-term retrospective
study

Foreign language

"Demailly, Philippe, Kretz, G, and Zogheib, R. Argon laser

No original data (e.g., systematic review, narrative review, editorial,
letter)

"Demeter, S. and Hailey, D. Non-penetrating glaucoma surgery using
AquaFlow(TM) collagen implants (Structured abstract)

Duplicate"

"Denis, P., Andrew, R., Wells, D., and Friren, B. A comparison of
morning and evening instillation of a combination travoprost
0.004%/timolol 0.5% ophthalmic solution. Eur J Ophthalmol 2006 ;16

Does not include treatment for open-angle glaucoma (medical,
surgical or combined)

"Denis, P., Demailly, P., and Saraux, H. [Clinical evaluation of betaxolol
in ophthalmic suspension with or without preservative agent in patients
with glaucoma or ocular hypertension]. J Fr Ophtalmol 93 ;16 (5): 297-
303 .

Short term follow up only (less than 1 month for medical study/1 year
for surgical study) but it is not a 24 hour study"

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

Other (specify):Study design not good for KQ (KQ3 -24h study)"

No original data (e.g., systematic review, narrative review, editorial, letter)

Data not abstractable

It is combined cataract/glaucoma surgery study published before April 2000
• "Derick, R. J., Robin, A. L., Tielsch, J., Wexler, J. L., Kelley, E. P., Stoecker, J. F., Novack, G. D., and Coleman, A. L. Once-daily versus twice-daily levobunolol (0.5%) therapy. A crossover study

Unique comparators

Unique comparators

Meeting abstract

OAG can't be analyzed separately
• "Desai, R. U., Pekmezci, M., Tan, D., Song, J., and Lin, S. C. Resident-performed Ahmed(trademark) glaucoma valve surgery

Duplicate of 170"
• "Desvignes, P. [Results of medical treatment in chronic open angle glaucoma]

Foreign language
• "Detry-Morel, M. and De Hoste, F. [Treatment of glaucoma with carbonic anhydrase inhibitors in eyewash: medium term retrospective experience with dorzolamide]

Foreign language
• "Detry-Morel, M. and Dutrieux, C. [Treatment of glaucoma with brimonidine (Alphagan 0.2%)]

Foreign language
• "Detry-Morel, M. and Dutrieux, C. Experience with topical brimonidine (Alphagan(registered trademark) 0,2%) in the treatment of glaucomas: Traitement des glaucomes par la brimonidine (Alphagan(registered trademark) 0,2 %)

Foreign language

It is a case series

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

It is not a RCT and has less than 100 patients
• "Devonport, H. and Manners, T. D. Comparison of viscocanalostomy with trabeculectomy in the management of chronic open angle glaucoma

Meeting abstract


It is combined cataract/glaucoma surgery study published before April 2000

• "Di Tizio, A., Catone, E., and Glorialanza, G. Our results in the treatment of open angle glaucoma with timolol maleate: NOSTRI RISULTATI NEL TRATTAMENTO DEL GLAUCOMA AD ANGOLO APERTO CON IL TIMOLOLO MALEATO

Foreign language

• "Di Tizio, A., Mutolo, A., and Glorialanza, G. Epinephrine-oxprenolol association in the treatment of open angle glaucoma: ASSOCIAZIONE ADRENALINA E OXPRENOLOLO NELLA TERAPIA DEL GLAUCOMA AD ANGOLO APERTO

Foreign language

• "Diafas, S., G Day, D., Stewart, J. A., and Stewart, W. C. The use of dorzolamide versus other hypotensive agents to prevent glaucomatous progression

Unique comparators


Data not abstractable


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Dienstbier, E., Ruzickova, E., and Cepelik, J. [Metipranolol in the treatment of glaucoma. Introductory clinical study (author's transl)].

Foreign language


Other (specify):not FDA approved

• "Diestelhorst, M. and German Latanoprost Study Group. COMPARISON OF FIXED-RATIO COMBINATIONS OF LATANOPROST AND TIMOLOL. A RANDOMISED, DOUBLE-MASKED MULTICENTRE STUDY IN GLAUCOMA PATIENTS WITH TIMOLOL AND LATANOPROST AS CONTROLS

Meeting abstract


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Diestelhorst, M. and Larsson, L. I. A 12 week study comparing the fixed combination of latanoprost and timolol with the concomitant use of the individual components in patients with open angle glaucoma and ocular hypertension

Non-FDA-approved drug combination

• "Diestelhorst, M. and Larsson, L. I. A 12-week, randomized, double-masked, multicenter study of the fixed combination of latanoprost and timolol in the evening versus the individual components. Ophthalmology 2006 ;113 (1): 70-6 .

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• "Diestelhorst, M. The additive intraocular pressure-lowering effect of latanoprost 0.005% daily once and pilocarpine 2% t.i.d. in patients with open-angle glaucoma or ocular hypertension. a 6-month, randomized, multicenter study. German Latanoprost Study Group

Excluded drug


Other (specify):pilocarpine


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

OAG can't be analyzed separately

• "Diestelhorst, M., Roters, S., and Krieglstein, G. K. THE EFFECT OF LATANOPROST (PHXA41) ON THE INTRAOCULAR PRESSURE AND AQUEOUS HUMOR PROTEIN CONCENTRATION A RANDOMIZED, DOUBLE MASKED COMPARISON OF 50 µg/ml vs 15 µg/ml WITH TIMOLOL 0.5% AS CONTROL

Meeting abstract

• "Diestelhorst, M., Roters, S., and Krieglstein, G. K. The effect of latanoprost 0.005% once daily versus 0.0015% twice daily on intraocular pressure and aqueous humour protein concentration in glaucoma patients. A randomized, double-masked comparison with timolol 0.5%

Medical KQ 3 or KQ 3 and KQ 6 only


Medical KQ 3 only


No original data (e.g., systematic review, narrative review, editorial, letter)


No subjects with open-angle glaucoma

• "Diggory, P., Cassels-Brown, A., Vail, A., Abbey, L., and Hillman, J. S. Changing from Timolol to the Cardioselective Betaxalo Improves Lung Function and Exercise Tolerance in the Elderly

Meeting abstract


It is not a RCT and has less than 100 patients

• "Ding, Q., Tan, R., Zheng, C., and Xu, W. [Comparative analysis of the formation of functional filtration bleb in different incision of conjunctiva flap after trabeculectomy]

Foreign language

• "Dinslage, S., Diestelhorst, M., and Krieglstein, G. K. [A new transdermal alternative for pilocarpine in the treatment of glaucoma]

Meeting abstract


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• "Dirks, M. and 6-Month Bimatoprost-Latanoprost Study Group. Comparison of IOP-Lowering Efficacy of Bimatoprost and Latanoprost in Patients with Glaucoma or Ocular Hypertension: A Six-month Randomized Clinical Trial

Meeting abstract

• "Dirks, M. and Brimonidine Study Group. LONG-TERM SAFETY AND IOP-LOWERING EFFICACY OF BRIMONIDINE TARTRATE 0.2% IN GLAUCOMA AND OCULAR HYPERTENSION

Meeting abstract


Meeting abstract

• "Dirks, M. S., Girkin, C. A., Tello, C., Chaplin, N. T., Batoosingh, A., Bernstein, P., Whitcup, S., and Bimatoprost/Latanoprost Study Group. Comparing the IOP-Lowering Efficacy of Bimatoprost and Latanoprost Within Separate Glaucoma or Ocular Hypertension Patient Subsets

Meeting abstract


Meeting abstract

• "Dirks, M., Conner, C., and Barnes, S. D. A COST MINIMIZATION ANALYSIS COMPARING BRIMONIDINE TO APRACLONIDINE IN IOP CONTROL FOLLOWING ALT
Meeting abstract
• "Dirks, M., Neecker, R., Williams, R., and Earl, M. A Comparison of the IOP Lowering Efficacy of Bimatoprost and Latanoprost in the Treatment of Normal Tension Glaucoma
Meeting abstract
• "Dobler, A. and Pederson, J. MITOMYCIN VS. 5-FLUOROURACIL IN GLAUCOMA FILTERING SURGERY
Meeting abstract
• "Dobromyslov, A. N., Alekseev, V. N., and Zagarul’ko, A. M. [The expediency of peripheral iridectomy in the surgical treatment of open-angle glaucoma]
Foreign language
It is a case series
• "Doi, L. M, Melo, L. A S Jr, and Prata, J. A Jr. EFFECTS ON INTRAOCULAR PRESSURE IN PRIMARY OPEN-ANGLE GLAUCOMA AFTER COMBINED THERAPY WITH LATANOPROST AND BIMATOPROST: A RANDOMIZED CLINICAL TRIAL
Meeting abstract
• "Doi, L. M., Melo, L. A Jr, and Prata, J. A Jr. Effects of the combination of bimatoprost and latanoprost on intraocular pressure in primary open angle glaucoma: a randomised clinical trial
Unique comparators
Foreign language
• "Domingo Regany, E., Quilis Salcedo, M., and Massague Camins, C. [Timolol: adverse cardiorespiratory effects]
Foreign language
• "Dong, D. Q., Chen, G., and Hou, X. W. [Clinical observation of the combination of phacoemulsification and trabeculectomy]
Foreign language
No original data (e.g., systematic review, narrative review, editorial, letter)
Other (specify): Non-english
• "Donoso, R., Rodrigo, Monsalve, Rudy, Monsalve, Pablo, Armas, Rodolfo, Charl/En, Raimundo, Eggers Koster, Andrqs, Khaw, Peng, Schweikart, Adolfo, Varela, Hernbn, and Wilkins, Marek. 5-Fluorouracilo intraoperatorio en trabeculectomÆa a primaria
Foreign language
It is not a RCT and has less than 100 patients
• "Donoso, Rodrigo and Rodr/Æguez, Alonso. FacoemulsificaciÆn y trabeculectomÆa con 5-fluorouracil intraoperatorio: operaciÆn combinada versus secuencial: un estudio caso control
Foreign language
• "Donoso, Rodrigo, Armas, Rodolfo, Charl/Æn, Raimundo, Eggers, Andrqs, Schweikart, Adolfo, Varela, Hernbn, and LPez, Juan Pablo. Estudio prospectivo randomizado de exposiciÆn intraoperatoria ·nica A 5-FU en trabeculectomÆa a primaria en glaucoma de bngulo abierto
Foreign language
Does not address any key questions
• "Dorner, G. T., Rainer, G., Garhofer, G., Findl, O., Georgopoulos, M., Polak, K., Petternel, V., Vass, C., Pfleger, T., and Schmetterer, L. Changing antiglaucoma therapy from timolol to betaxolol: Effect on optic disk blood flow
Meeting abstract
• "Dorzolamide hydrochloride. DRUGS FUTURE 96 ;21 (4): 413-414.
No original data (e.g., systematic review, narrative review, editorial, letter)
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Does not address any key questions

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

"Draeger, J., Haselmann, G., and Weber, B. The influence of pilocarpine upon the aqueous humour dynamics using ocusert with continuous delivery rate: DER EINFLUSS VON PILOCARPIN AUF DIE KAMMERWASSERDYNAMIK BEI VERWENDUNG VON MEDIKAMENTENTRAGERN MIT KONTINUIERLICHER ABGABERATE
Duplicate "

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

Other (specify): pilocarpine

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Drance, S. M., Crichton, A., and Mills, R. P. Ocular Perfusion Pressure in Normal Tension Glaucoma Patients After Latanoprost or Timolol Treatment
Meeting abstract

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Duan, X., Jiang, Y., and Mo, X. [Long-term follow-up study on Hunan aqueous drainage implantation for refractory glaucoma]
Foreign language

"Duan, X., Jiang, Y., and Qing, G. [Long-term follow-up study on Hunan aqueous drainage implantation combined with mitomycin C for refractory glaucoma]
Foreign language

"DuBiner, H. B and Shapiro, A. M. Efficacy and Tolerability of Brimonidine vs. Latanoprost as First-Line Therapy for Glaucoma or Ocular Hypertension
Meeting abstract

"DuBiner, H. B, Kothe, A. C, Sharma, V., Mallick, S., Andrew, R. M., Sullivan, E. K, Weiner, A. L, DeSantis, L. M, Krueger, S., Bergamini, M. V W, and Study Group. A comparison of the diurnal IOP-lowering efficacy of levobetaxolol 0.5% vs. brimonidine 0.2% in patients with open-angle glaucoma or ocular hypertension
Meeting abstract

Meeting abstract

Medical KQ 3 or KQ 3 and KQ 6 only

- "DuBiner, H. B., Mroz, M., Shapiro, A. M., and Dirks, M. S. A comparison of the efficacy and tolerability of brimonidine and latanoprost in adults with open-angle glaucoma or ocular hypertension: a three-month, multicenter, randomized, double-masked, parallel-group trial"
- "DuBiner, H., Cooke, D., Dirks, M., Stewart, W. C., VanDenburgh, A. M., and Felix, C. Efficacy and safety of bimatoprost in patients with elevated intraocular pressure: a 30-day comparison with latanoprost"
- "DuBiner, H., Mroz, M., and Shapiro, A. EFFICACY AND TOLERABILITY OF BRIMONIDINE VERSUS LATANOPROST AS FIRST-LINE THERAPY FOR GLAUCOMA OR OCULAR HYPERTENSION"
- "Duch, S., Duch, C., Pasto, L., and Ferrer, P. Changes in depressive status associated with topical beta-blockers. Int Ophthalmol 92 ;16 (4-5): 331-5. It is not a RCT and has less than 100 patients"
- "Duff, G. R. and Newcombe, R. G. The 12-hour control of intraocular pressure on carteolol 2% twice daily"
- "Duff, G., Graham, P., and Watt, A. Comparison of ocular and cardiovascular effects of oral nadolol and topical timolol in patients at risk of glaucoma. [abstract]. British Journal of Pharmacology 86 ;89 : 711P. Does not address any key questions"
- "Dunn, M. Timolol-induced bronchospasm. JAMA 82 ;247 (1): 27-8. No original data (e.g., systematic review, narrative review, editorial, letter)"
- "Durante, A., Aurilia, P., Guarnaccia, G., and Boles Carennini, B. The hypotensive efficacy of dorzolamide HCL-timolol maleate 0.50% vs concomitant use of the two drugs"
- "Duzman, E., Ober, M., Scharrer, A., and Leopold, I. H. A clinical evaluation of the effects of topically applied levobunolol and timolol on increased intraocular pressure"
- "Duzman, E., Quinn, C. A., Warman, A., and Warman, R. One-month crossover trial comparing the intraocular pressure control of 3.4% Pilocarpine twice daily with 2.0% pilocarpine four times daily. Acta Ophthalmol (Copenh) 82 ;60 (4): 613-21. Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study"
- "Easty, D. L., Nemeth-Wasmier, G., Vounatsos, J. P., Girard, B., Besnainou, N., Pouliquen, P., Delval, L., and Rouland, J. F. Comparison of a non-preserved 0.1% T-Gel eye gel (single dose unit) with a preserved 0.1% T-Gel eye gel (multidose) in ocular hypertension and glaucomatous patients"
- "Ecoffet, M. and Demailly Ph. Middle-term results of a double-blind study comparing metipranolol to timolol in the treatment of primary open-angle glaucoma. Comparison between Metipranolol and Timolol: RESULTATS D'UNE ETUDE A MOYEN TERME A DOUBLE INSU COMPARANT LE METIPRANOLOL AU TIMOLOL DANS LE TRAITEMENT DU GLAUCOME PRIMITIF A ANGLE OUVERT"
- "Ecoffet, M. and Demailly Ph. Middle-term double blind study in the treatment of chronic open angule glaucoma: Comparison between Metipranolol and Timolol: RESULTATS D'UNE ETUDE A MOYEN TERME A DOUBLE INSU COMPARANT LE METIPRANOLOL AU TIMOLOL DANS LE TRAITEMENT DU GLAUCOME PRIMITIF A ANGLE OUVERT"
- "Eckerhardt, B. and Hutz, W. [Revision suture in covered goniotrepanation]. Ophthalmologe 93 ;90 (6): 578-80. It is a case series"
- "Ecoffet, M. and Demailly Ph. Middle-term double blind study in the treatment of chronic open angle glaucoma: Comparison between Metipranolol and Timolol: RESULTATS D'UNE ETUDE A MOYEN TERME A DOUBLE INSU COMPARANT LE METIPRANOLOL AU TIMOLOL DANS LE TRAITEMENT DU GLAUCOME PRIMITIF A ANGLE OUVERT"
- "Ecoffet, M. and Demailly Ph. [Mid-term results of a double-blind study comparing metipranolol to timolol in the treatment of primary open-angle glaucoma]. J Fr Ophtalmol 87 ;10 (6-7): 451-4. It is not a RCT and has less than 100 patients"

OAG can't be analyzed separately

Does not address any key questions

Other (specify): No control group

Other (specify): Case series

Other (specify): Study design does not match KQ

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Does not address any key questions
- "Eggers Koster, Andørq and Kychenthal B., Andørq. acotrabeculectom: Ea

Foreign language
- "Egorov, E. A. and Khiva, S. A. [Effectiveness of timolol maleate in hypotensive therapy of glaucoma]

Foreign language
- "Egorov, E. A. and Shmeleva, I. A. [Results of the clinical study of a new adrenergic beta blocker levobunolol hydrochloride in healthy subjects and in patients with glaucoma]

Foreign language
- "Egorov, E. A., Tsibaneva, E. V., and Egorov, A. E. [Efficacy of pilocarpine and timolol maleate combination in therapy of glaucoma]

Foreign language
- "Egorov, E. and Ropo, A. Adjunctive use of tafloproust with timolol provides additive effects for reduction of intraocular pressure in patients with glaucoma

Duplicate

Other (specify): Tafloproust
- "Egorov, V. V., Sorokin, E. L., and Smoliakova, G. P. [Differentiated approaches to the treatment of nonstabilized primary open-angle glaucoma with normalized intraocular pressure considering its pathogenic features]

Foreign language

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Other (specify): No control group

It is a case series

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

No original data (e.g., systematic review, narrative review, editorial, letter)

"Eisenberg, D. L. Additive efficacy of unoprostone isopropyl 0.12% (rescula) to latanoprost 0.005%. Am J Ophthalmol 2001;132 (3): 448-9. Does not include treatment for open-angle glaucoma (medical, surgical or combined)

"Eisenberg, D. Latanoprost versus bimatoprost. Ophthalmology 2003;110 (9): 1861-2; author reply 217-8. No original data (e.g., systematic review, narrative review, editorial, letter)


"El Sayyad, F. F, Helal, M., El-Hamzawey, H., and El-Maghraby, M. A. Superior Mitomycin (MMC) Filter Combined with Temporal Clear Corneal Phacoemulsification (TCC Phaco) and Foldable IOL Meeting abstract


"El Sayyad, F., Elsharif, Z., Helal, M., Balajonda, M. N G, and El-Maghraby, A. Fornix-Based vs. Limbal-Based Tenon's Flap in Bilateral Trabeculectomy in Primary Open-Angle Glaucoma (POAG), Meeting abstract

"El Sayyad, F., Helal, M. M, Elsherif, Z., and El-Maghraby, A. Single Plate Molteno Implant Combined with Mitomycin C (MMC) Trabeculectomy in Difficult Glaucomas Meeting abstract

"El Sayyad, F., Helal, M., El Sherif, Z., and El-Maghraby, M. A. Trabeculectomy With Adjunctive Intraoperative 5-Fluorouracil (5-FU) in Primary Open-Angle Glaucoma (POAG) Meeting abstract

"El Sayyad, F., Helal, M., El-Kholify, H., Khalil, M., and El-Maghraby, A. Nonpenetrating deep sclerolcytectomy versus trabeculectomy in bilateral primary open-angle glaucoma Cheng 2009

"El Sayyad, F., Helal, M., El-Maghraby, A., Khalil, M., and el-Hamzawey, H. One-site versus 2-site phacotrabeculectomy: a randomized study. J Cataract Refract Surg 99;25 (1): 77-82. It is not a RCT and has less than 100 patients


"El Sayyad, F., Helal, M., Elsharif, Z., and El-Maghraby, A. FORNIX-BASED VERSUS LIMBAL-BASED TENON'S FLAP IN BILATERAL TRABECULECTOMY Meeting abstract

"El Sayyad, F., Helal, M., Elsherif, Z., and El-Maghraby, A. Molteno implant versus trabeculectomy with adjunctive intraoperative mitomycin-C in high-risk glaucoma patients. J. GLAUCOMA 95;4 (2): 80-85. OAG can't be analyzed separately

"El Sayyad, F., Elsharif, Z., Helal, M., El-Maghraby, A. FORNIX-BASED VERSUS LIMBAL-BASED TENON'S FLAP IN BILATERAL TRABECULECTOMY Meeting abstract

"El Sayyad, F., Helal, M., Elsherif, Z., and El-Maghraby, A. FORNIX-BASED VERSUS LIMBAL-BASED TENON'S FLAP IN BILATERAL TRABECULECTOMY Meeting abstract

"Eldaly, M. A. Pneumatic trabecular bypass (PTB): pilot study Systematic review

"Elena, P. P., Rouland, J. F., Morel-Mandrino, P., and Polzer, H. THERAPEUTIC EQUIVALENCE OF A TIMOLOL 0.1% HYDROGEL (T-GEL 0.1%) QD AND AQUEOUS TIMOLOL 0.5% BID IN REDUCING THE IOP OF GLAUCOMATOUS PATIENTS Meeting abstract


D-47
Amniotic Membrane in Trabeculectomy for the Treatment of Glaucoma - A Pilot Study

Meeting abstract


It is a case series


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is not a RCT and has less than 100 patients


It is combined cataract/glaucoma surgery study published before April 2000

"El-Sayyad, F., El-Maghraby, A., Amayam, A., and Helal, M. Fornix-Based Versus Limbal-Based Conjunctival Flap in Trabeculectomy with 5-Fluourouracil (5-FU) Meeting abstract


"Emmerich, K. H. [Latanoprost-monotherapy in comparison with adjunction of timolol and dorzolamide in patients with glaucoma or ocular hypertension] Meeting abstract

"Emmerich, K. H. A Comparison of Latanoprost Monotherapy to Dorzolamide Combined with Timolol in Glaucoma and Ocular Hypertension Patients Meeting abstract

"Emmerich, K. H. Comparison of latanoprost monotherapy to dorzolamide combined with timolol in patients with glaucoma and ocular hypertension. A 3-month randomised study KQ 3 RCT

"Englert, J. A., Cox, T. A., Allingham, R. R., and Shields, M. B. Argon vs diode laser trabeculoplasty. Am J Ophthalmol 97 ;124 (5): 627-31 . Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Englund, G. W. Fatal pancytopenia and acetazolamide therapy. JAMA 69 ;210 (12): 2282 .

It is a case series


No original data (e.g., systematic review, narrative review, editorial, letter)

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not address any key questions


It is not a RCT and has less than 100 patients

• "Erichev, V. P. [Comparative evaluation of the hypotensive effectiveness of beta blockers] Foreign language

• "Erichev, V. P. and Maichuk, I. u. F. [Experience with the use of timolol maleate in the therapy of open-angle glaucoma] Foreign language

• "Erichev, V. P. and Maichuk, I. u. F. [Pilaren in the therapy of open-angle glaucoma] Foreign language


• "Erichev, V. P., Salminen, L., and Maichuk, I. u. F. [Ocular hypotensive effect of low doses of timolol] Foreign language

• "Erkin, E. F., Celik, P., Kayikcioglu, O., Deveci, H. M., and Sakar, A. Effects of latanoprost and betaxolol on cardiovascular and respiratory status of newly diagnosed glaucoma patients Unique comparators

• "Ermakova, V. N. [A clinicopharmacological study of an ophthalmic drug form of proxodolol] Foreign language

• "Ermakova, V. N. [Results of the use of Thymoptik (timolol) in the treatment of primary glaucoma] Foreign language


• "Ermakova, V. N., Malinina, S. L., and Abdulkadyrova, M. Z. h. [Comparative evaluation of the tolerability of proxofelin and clofelin and their effects on the eye in patients with glaucoma] Foreign language

• "Ershkovich, I. G. [Trabeculectomy in open-angle glaucoma] Foreign language

• "Eschstruth, P. and Schmidt, J. [External trabeculotomy (ETE): an alternative? A retrospective comparison with goniotrepanation] Foreign language

• "Eschstruth, P. and Schmidt, J. External trabeculotomy (ETE): An alternative? A retrospective comparison with goniotrepanation: Externe trabekulektomie (ETE): Eine alternative? Eine retrospektive studie zur goniotrepanation Duplicate"

• Estudio ultrabiomecroscopico en ablacion trabecular con laser y su relacion con la apariencia de la ampolla conjuntival y la presion intraocular Foreign language

• Estudo do efeito da trabeculoplastia na redução de medicamentos hipotensores oculares utilizados em pacientes glaucomatosos. 2003. Foreign language

• "Evans, D. W., Bartlett, J., Houde, B., and Than, T. Effect of Latanoprost Therapy on Contrast Sensitivity in Glaucoma Patients Meeting abstract

• "Eyawo, O., Nachega, J., Lefebvre, P., Meyer, D., Rachlis, B., Lee, C. W., Kelly, S., and Mills, E. Efficacy and safety of prostaglandin analogues in patients with predominantly primary open-angle glaucoma or ocular hypertension: a meta-analysis Systematic review

• "Facio, A. C., Reis, A. S., Vidal, K. S., de Moraes, C. G., Suzuki, R., Hatanaka, M., and Susanna, R. A comparison of bimatoprost 0.03% versus the fixed-combination of latanoprost 0.005% and timolol 0.5% in adult patients with elevated intraocular pressure: a eight-week, randomized, open-label trial. J Ocul Pharmacol Ther 2009 ;25 (5): 447-51 .

Other (specify):not FDA approved"

Other (specify): Mean age less than 50"

"Fang, A., Xu, M., Li, Y., and Ye, L. [Microtrebeculectomy in glaucoma]

Foreign language


It is combined cataract/glaucma surgery study published before April 2000


Medical KQ 3 only


It is a case series

"Fechtner, R. D., Airaksinen, P. J., Getson, A. J., Lines, C. R., and Adamsons, I. A. Efficacy and tolerability of the dorzolamide 2%/timolol 0.5% combination (COSOPT(trademark)) versus latanoprost 0.005% (XALATAN(trademark)) in the treatment of ocular hypertension or glaucoma: Results from two randomized clinical trials

Medical KQ 3 or KQ 3 and KQ 6 only


Data not abstractable


OAG can't be analyzed separately

"Feghali, J. G, Klussmann, K. G, and Viti, A. J. Effect of the Tightness of Scleral Flap Closure on the Outcome of Trabeculectomy and Its Complications

Meeting abstract

"Feghali, J. G. and Kaufman, P. L. Decreased intraocular pressure in the hypertensive human eye with betaxolol, a beta 1-adrenergic antagonist

Medical KQ 3 or KQ 3 and KQ 6 only


Medical KQ 3 or KQ 3 and KQ 6 only

"Feibel, R. M. High incidence of topical allergic reactions to 1% apraclonidine. Arch Ophthalmol 95 ;113 (12): 1579-80.

No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)


It is a case series

"Feldman, R. M. A Comparison of Fixed Combination of Latanoprost and Timolol with Fixed Combination of Dorzolamide and Timolol (COSOPT) in Patients With Elevated Intraocular Pressure: A Three-month Masked Evaluator, Phase IIIb, Multicenter Study in the United States (XALCOM vs. COSOPT)

Meeting abstract

"Feldman, R. M., Prager, T. C., Baker, L., Chuang, A. Z., and Additivity Study Group. Additivity of Brinzolamide vs. Brimonidine 0.15% to Travoprost 0.004%
Meeting abstract

"Feldman, R. M., Stewart, R. H., Stewart, W. C., Jia, G., Gergich, K., Smugar, S. S., and Galet, V. A. 24-Hour Diurnal IOP Lowering Efficacy of 2% Dorzolamide/0.5% Timolol Maleate Combination Ophthalmic Solution in Open Angle Glaucoma or Ocular Hypertension

Meeting abstract

"Feldman, R. M., Stewart, R. H., Stewart, W. C., Jia, G., Gergich, K., Smugar, S. S., and Galet, V. A. 24-hour Diurnal IOP Lowering Efficacy of 2% Dorzolamide/0.5% Timolol Maleate Combination Ophthalmic Solution in Open Angle Glaucoma or Ocular Hypertension

Meeting abstract

"Feldman, R. M., Stewart, R. H., Stewart, W. C., Jia, G., Smugar, S. S., and Galet, V. A. 24-hour control of intraocular pressure with 2% dorzolamide/0.5% timolol fixed-combination ophthalmic solution in open-angle glaucoma

Unique comparators

"Feldman, R. M., Tanna, A. P., Gross, R. L., Chuang, A. Z., Baker, L., Reynolds, A., and Prager, T. C. Comparison of the ocular hypotensive efficacy of adjunctive brimonidine 0.15% or brinzolamide 1% in combination with travoprost 0.004%

Medical KQ 3 only

"Feldman, Robert M. Actualización sobre la combinación de latanoprost y timolol, en proporción fija, para el tratamiento de glaucoma de bngulo abierto y la hipertensión ocular

Foreign language


No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)

"Fellman, R. L. and Travoprost Study Group. TRAVOPROST IS SUPERIOR TO TIMOLOL IN LOWERING IOP IN PATIENTS WITH OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION

Meeting abstract


It is not a RCT and has less than 100 patients

"Fellman, R. L., Sullivan, E. K., Ratliff, M., Silver, L. H., Whitson, J. T., Turner, F. D., Weiner, A. L., and Davis, A. A. Comparison of travoprost 0.0015% and 0.004% with timolol 0.5% in patients with elevated intraocular pressure: a 6-month, masked, multicenter trial

Medical KQ 3 or KQ 3 and KQ 6 only


Other (specify): comparison of 2 case series

"Feng, J.-H., Song, W.-L., and Zhao, C.-Y. Mitomycin C and sodium hyaluronate in trabeculectomy

Foreign language

"Feng, Y. [Trabeculectomy combined with mitomycin C and removed suture in glaucoma]

Foreign language

"Feng, Z. [Remote results of trabeculectomy (author's transl)]

Foreign language

"Fenton, R. M., Rubin, B. I., de Smet, M. D., Whitcup, S. M., and Nussenblatt, R. B. A PROSPECTIVE STUDY OF 5-FU TRABECULECTOMY VS SINGLE PLATE MOLTENO IMPLANT IN PATIENTS WITH PANUVEITIS COMPLICATED BY GLAUCOMA REFRACTORY TO PRIOR THERAPY

Meeting abstract


It is not a RCT and has less than 100 patients


Other (specify): only patients without surgical failure, It is a case series

• Other (specify):unique comparator, Does not include treatment for open-angle glaucoma (medical, surgical or combined) • "Fernandez-Vozmediano, J. M., Blasi, N. A., Romero-Cabrera, M. A., and Carrascosa-Cerquero, A. Allergic contact dermatitis to timolol. Contact Dermatitis 86 ;14 (4): 252 .

• It is a case series • "Ferri, M., Parmeggiani, F., Gasiolli, E., Gavioli, I., Peruz, G., Maciga, C., and Costagliola, C. Topical administration of apraclonidine 0.1% and brimonidine 0.2% in patients affected by primary open-angle glaucoma: Effects on ocular perfusion pressure and visual field parameters: Somministrazione topica di apraclonidina 0.1% e brimonidina 0.2% in pazienti affetti da glaucoma primario ad angolo aperto: Effetti sulla pressione di perfusione oculare e sugli indici perimetrici • Foreign language • "Ferry, A. P. and Lichtig, M. Gouty arthritis as a complication of acetazolamide (Diamox) therapy for glaucoma. Can J Ophthalmol 69 ;4 (2): 145-7 .

• It is a case series • "Feuerhake, C., Buchholz, P., and Kimmich, F. Efficacy, tolerability and safety of the fixed combination of bimatoprost 0.03% and timolol 0.5% in a broad patient population: multicenter, open-label observational study. Curr Med Res Opin 2009 ;25 (4): 1037-43 .


• It is not a RCT and has less than 100 patients • "Flach, A. J. Efficacy of apraclonidine ophthalmic solution (iopidine) in presumed silicon oil-induced glaucoma and primary open-angle glaucoma. Surv Ophthalmol 95 ;40 (1): 84-5 .


• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• It is not a RCT and has less than 100 patients
• "Flammer, J., Collignon-Brach, J., Demailly, P., and Graves, S. A. [A long-term study of the visual fields in patients treated with betaxolol and timolol]
• Foreign language
• Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• Does not address any key questions
• It is a case series
• Data not abstractable
• Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• It is a case series
• Does not address any key questions
• "Francis, B. A. A Multi-Site Evaluation of a Fixed Combination Therapy of Dorzolamide-Timolol (Cosopt®) Compared with Concomitant Administration of a Topical Beta-Blocker and Dorzolamide Meeting abstract
• "Francis, B. A., Du, L. T., Berke, S., Ehrenhaus, M., and Minckler, D. S. Comparing the fixed combination dorzolamide-timolol (Cosopt) to concomitant administration of 2% dorzolamide (Trusopt) and 0.5% timolol -- a randomized controlled trial and a replacement study Medical KQ 3 or KQ 3 and KQ 6 only
• It is not a RCT and has less than 100 patients
• Does not address any key questions
• "Francois, J., Goes, F., and Stockmans, L. [Acute glaucoma after pilocarpine instillation]
Foreign language

- "Francois, J., Goes, F., and Stockmans, L. [Acute glaucoma secondary to instillation of pilocarpine]
- "Franks, W. A., Renard, J. P., Cunliffe, I. A., and Rojanapongpun, P. A 6-week, double-masked, parallel-group study of the efficacy and safety of travoprost 0.004% compared with latanoprost 0.005%/timolol 0.5% in patients with primary open-angle glaucoma or ocular hypertension. Clin. Ther. 2006 ;28 (3): 332-339 .

Other (specify): Mean age below 50"

- "Franks, W. A., Renard, J. P., Cunliffe, I. A., and Rojanapongpun, P. A 6-week, double-masked, parallel-group study of the efficacy and safety of travoprost 0.004% compared with latanoprost 0.005%/timolol 0.5% in patients with primary open-angle glaucoma or ocular hypertension. Clin Ther 2006 ;28 (3): 332-9 .

Other (specify): Uses not FDA approved drug"

- "Frenkel, R. E., Noecker, R. J., and Craven, E. R. Evaluation of circadian control of intraocular pressure after a single drop of bimatoprost 0.03% or travoprost 0.004%. Curr Med Res Opin 2008 ; 24 (4): 919-23 .

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)

- "Frizzotti, P., Ciappetta, R., Nuti, A., Traversi, C., and Frizzotti, R. 2% IBOPAMINE EYE DROPS IN THE TREATMENT OF TRANSIENT OCULAR HYPOTONY AFTER TRABECULECTOMY IN PRIMARY OPEN-ANGLE GLAUCOMA AND CHRONIC ANGLE-CLOSURE GLAUCOMA

Meeting abstract


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Friedman, D. S., Okeke, C. O., Jampel, H. D., Ying, G. S., Plyler, R. J., Jiang, Y., and Quigley, H. A. Risk factors for poor adherence to eyedrops in electronically monitored patients with glaucoma
Systematic review
• "Fristrom, B. A 6-month, randomized, double-masked comparison of latanoprost with timolol in patients with open angle glaucoma or ocular hypertension
Medical KQ 3 or KQ 3 and KQ 6 only
• "Fristrom, B. and Nilsson, S. E. A double masked comparison of the intraocular pressure reducing effect of latanoprost 0.005% and 0.001% administered once daily in open angle glaucoma and ocular hypertension
Unique comparators
Does not include treatment for open-angle glaucoma (medical, surgical or combined)
Other (specify):Control group poorly described"
Does not address any key questions
• "Fuchsjaeger-Mayrl, G., Rainer, G., Georgopoulos, M., Buehl, W., Vass, C., Kircher, K., and Schmetterer, L. Dorzolamide increases ocular blood flow in patients with open angle glaucoma and ocular hypertension
Meeting abstract
It is not a RCT and has less than 100 patients
It is not a RCT and has less than 100 patients
Does not address any key questions
• "Funk, J. and Frank, A. [Long-term reduction of intraocular pressure by goniotrepanation or laser trabeculoplasty]
Duplicate 8421"
• "Funk, J. and Frank, A. Long term IOP reduction after goniotrephination or laser trabeculoplasty: LANGFRISTIGE AUGENDRUCKSENKUNG DURCH GONIOTREPANATION ODER LASERTRABEKULOPLASTIK
Foreign language
OAG can’t be analyzed separately
• "Gomez Toledo, patricio. La microcirculacion ocular estudiada con eco Doppler color en pacientes con glaucoma y los efectos de dorzolamida timolol en el flujo
Foreign language
OAG can’t be analyzed separately
• "Gafencu, O., Carstocea, B., and Ionita, M. [Prostaglandin esters--new directions in the treatment of glaucoma]
Foreign language
• "Gagliano, C., Ortisi, E., Pulvirenti, L., Reibaldi, M., Soillo, D., Amato, R., Avitabile, T., and Longo, A. Ocular Hypotensive Effect of Oral

**Other (specify):** drug not available in US


**Does not address any key questions**


**It is a case series**

- "Gallardo Vallejo, Guadalupe and Montor Pacheco, Angülica Mar/Ea. Control postoperatorio de la presión intraocular en cirugía combinada de catarata y glaucoma con técnica habitual vs esclerotomía."

**Foreign language**


**Short term follow up only** (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


**Data not abstractable**


**It is a case series**


**Foreign language**


**Foreign language**

- "Gamero, G., Robison, M., Harmon, H., Goldsmith, R., Fechtner, R., and Zimmerman, T. THE DURATION OF ACTION OF DORZOLAMIDE 2% WITH CONCOMITANT USE OF A TOPICAL BETA ADRENERGIC ANTAGONIST.

**Meeting abstract**

- "Gamm, E. G. [Cause of the appearance of diacarb side effects]."

**Foreign language**

- "Gandol, S. A., Cimino, L., and Chetta, A. INCIDENCE OF BRONCHIAL HYPER REACTIVITY IN GLAUCOMATOUS SUBJECTS UPON LONGTERM USE OF TOPICAL BETA BLOCKERS."

**Meeting abstract**


**Meeting abstract**


**Meeting abstract**


**Meeting abstract**

- "Gandolfi, S. A. and Cimino, L. Effect of 0.03% Bimatoprost on Patients Non-responders to 0.005% Latanoprost: A Cross-over Study.

**Meeting abstract**

- "Gandolfi, S. A. and Cimino, L. Effect of bimatoprost on patients with primary open-angle glaucoma or ocular hypertension who are nonresponders to latanoprost.

**Medical KQ 3 only**


**It is combined cataract/glaucoma surgery study published before April 2000**


**Data not abstractable**

It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients

• “Gandolfi, S. A., David, R., and Brimonidine Additive Study Group. ADDITIVE EFFECT OF BRIMONIDINE 0.2% BID OR PILOCARPINE 2.0% TID IN PATIENTS UNCONTROLLED ON BETA-BLOCKER MONOTHERAPY
Meeting abstract
• “Gandolfi, S. A., Rossetti, L., Cimino, L., Mora, P., Tardini, M., and Orzalesi, N. Replacing maximum-tolerated medications with latanoprost versus adding latanoprost to maximum-tolerated medications: a two-center randomized prospective trial

Excluded drug

• “Gandolfi, S., Paredes, T., Goldberg, I., Coote, M., Wells, A., Volkstone, L., Pillai, M. R., Stalmans, I., and Denis, P. Comparison of a travoprost BAK-free formulation preserved with polyquaternium-1 with BAK-preserved travoprost in ocular hypertension or open-angle glaucoma. Eur J Ophthalmol 2011 ;

Other (specify): Does not report a mean age and 54.7% under age 65

• “Gandolfi, S., Simmons, S. T., Sturm, R., Chen, K., and VanDenburgh, A. M. Three-month comparison of bimatoprost and latanoprost in patients with glaucoma and ocular hypertension

Medical KQ 3 or KQ 3 and KQ 6 only


It is not a RCT and has less than 100 patients


Foreign language

Meeting abstract

• “García González, Frank, Sedeño Cruz, Ibis, Alemany González, Jaime, and Peralta Fernández, Jorge Orlando. Terapia combinada con timolol/dorzolamida versus timolol/pilocarpina en el glaucoma primario de bngulo abierto

Foreign language

• “Garcia Sanchez, J. Efficacy and side effects of latanoprost monotherapy compared to adding dorzolamide to timolol in patients with glaucoma and ocular hypertension–a three-month randomised study. Spanish Latanoprost Study Group

Medical KQ 3 or KQ 3 and KQ 6 only


It is a case series

• “Garcia-Feijoo, J., Martinez-de-la-Casa, J. M., Castillo, A., Mendez, C., Fernandez-Vidal, A., and Garcia-Sanchez, J. Circadian IOP-lowering efficacy of travoprost 0.004% ophthalmic solution compared to latanoprost 0.005%. Curr Med Res Opin 2006 ;22 (9): 1689-97 .

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• “Garcia-Feijoo, J., Saenz-Frances, F., Martinez-de-la-Casa, J. M., Mendez-Hernandez, C., Fernandez-Vidal, A., Calvo-Gonzalez, C., and Garcia-Sanchez, J. Comparison of ocular hypotensive actions of fixed combinations of brimonidine/timolol and dorzolamide/timolol

Medical KQ 3 only


Foreign language

• “Garcia-Sanchez, J. and Xalacom Study Group. Efficacy and Safety of the Fixed Combination Latanoprost/Timolol versus the Unfixed Combination Brimonidine/Timolol in Patients with Elevated Intraocular Pressure: A 6-month, Masked-evaluator Study

Meeting abstract

• “Garcia-Sanchez, J., Rouland, J. F., Spiegel, D., Pajic, B., Cunliiffe, I., Traverso, C., and Landry, J. A comparison of the fixed combination of latanoprost and timolol with the unfixed combination of brimonidine and
timolol in patients with elevated intraocular pressure. A six month, evaluator masked, multicentre study in Europe

**Non-FDA-approved drug combination**


**It is not a RCT and has less than 100 patients**

- “Garrett, M. A., Harris, A., Kagemann, L., Cantor, L. B., Garzozi, H. J., and Marino, A. SUBSTITUTION OF COSOPT TREATMENT FOR TIMOLOL TREATMENT HASTENS ARTERIOVENOUS PASSAGE IN GLAUCOMA PATIENTS

**Meeting abstract**


**No subjects with open-angle glaucoma**


**Meeting abstract**


**Meeting abstract**


**No original data (e.g., systematic review, narrative review, editorial, letter)**

- “Garzozi, H., Harris, A., Kagemann, L., Jonescu-Cuypers, C. P., Rotensteinreich, Y., Siesky, B., Cantor, L. B, Mcranor, L., and McNulty, L. Comparison of dorzolamide and latanoprost in normal-tension glaucoma: effects on IOP and retinal hemodynamics

**Meeting abstract**


**Meeting abstract**


**It is combined cataract/glaucma surgery study published before April 2000**


**It is combined cataract/glaucma surgery study published before April 2000**


**Systematic review**


**Data not abstractable**


**Data not abstractable**

- “Gedde, S. J., Schiffman, J. C., Feuer, W. J., Herndon, L. W., Brandt, J. D., and Budenz, D. L. Treatment Outcomes in the Tube versus Trabeculectomy (TVT) Study after Three Years of Follow-Up

**Meeting abstract**

OAG can't be analyzed separately


It is not a RCT and has less than 100 patients

• "Gelfand, Y. A. and Wolpert, M. Effects of topical indomethacin pretreatment on argon laser trabeculoplasty: a randomised, double-masked study on black South Africans. The British journal of ophthalmology 85 ;69 (9): 668-72.

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Genead, M. A., Fishman, G. A., and Walia, S. Efficacy of sustained topical dorzolamide therapy for cystic macular lesions in patients with X-linked retinoschisis

Systematic review


Other (specify): Study design does not match KQ


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Meeting abstract


It is combined cataract/glaucoma surgery study published before April 2000

• "Georgopoulos, G. T., Livir-Rallatos, G., Papaconstantinou, D. S, Patsea, E. E., Chalkiadakis, J., and Theodossiadis, G. P. A COMPARATIVE STUDY OF COMBINED CLEAR CORNEA PHACOEMULSIFICATION AND TRABECULAR ASPIRATION VS PHACOEMULSIFICATION ALONE IN THE TREATMENT OF PSEUDOEXFOLIATIVE GLAUCOMA ASSOCIATED WITH CATARACT

Meeting abstract

• "Georgopoulos, G. T., Papaconstantinou, D. S., Chalkiadakis, I., Patsea, E. S., Maragos, A., Iliakis, E., Andreanos, D. G., and Moschos, M. Long Term Results of Trabecular Aspiration in the Treatment of Pseudoexfoliative Glaucoma

Meeting abstract


OAG can't be analyzed separately

• "Gerkowicz, K. and Toczolowski, J. [Cataract cryoextraction combined with trabeculectomy]

Foreign language


Does not address any key questions

• "Geyer, O., Lazar, M., Novack, G. D., Lue, J. C., and Duzman, E. Levobunolol compared with timolol for the control of elevated intraocular pressure

Medical KQ 3 or KQ 3 and KQ 6 only

• "Geyer, O., Lazar, M., Novack, G. D., Shen, D., and Eto, C. Y. Levobunolol compared with timolol: a four-year study

Medical KQ 3 or KQ 3 and KQ 6 only


It is a case series


It is a case series

Does not address any key questions

- "Geyer, O., Rothkoff, L., and Lazar, M. Timolol-pilocarpine combined vs timolol and pilocarpine given separately (I)
Meeting abstract
No original data (e.g., systematic review, narrative review, editorial, letter)
Does not include treatment for open-angle glaucoma (medical, surgical or combined)
- "Gharagozloo, N. Z., Will, N., and Brubaker, R. F. EFFECT OF APRACLONIDINE IN CHRONIC TIMOLOL USERS
Meeting abstract
Meeting abstract
- "Ghajari, Almir, Daher, Leila, Jateni, Valqria, and Villani, EugWnia. Faco-trabeculectomia com LIOs dobrbveis: resultados a longo prazo
Foreign language
- "Gianoli, F. and Mermoud, A. [Cataract-glaucoma combined surgery: comparison between phacoemulsification combined with deep sclerectomy, or trabeculectomy]
Duplicate *
- "Gianoli, F. and Mermoud, A. Combined surgery: Comparison between phacoemulsification associated with deep sclerectomy or with trabeculectomy: Chirurgie combinee cataracte-glaucone: Comparaison entre phacoemulsification associee a une sclerectomie profonde, ou a une trabeculectomie
Foreign language
It is not a RCT and has less than 100 patients
Data not abstractable
It is combined cataract/glaucoma surgery study published before April 2000
No subjects with open-angle glaucoma
- "Gillies, W. E. and Brooks, A. M. A clinical trial of MK-507, Trusopt, for raised intraocular pressure—the Australian experience
Medical KQ 3 or KQ 3 and KQ 6 only
Data not abstractable
OAG can’t be analyzed separately
Does not address any key questions
OAG can’t be analyzed separately
- "Gilmour, D. F., Manners, T. D., Devonport, H., Varga, Z., Solebo, A. L., and Miles, J. Viscocanalostomy versus trabeculectomy for primary open angle glaucoma: 4-year prospective randomized clinical trial
Chai 2010
- "Gimbel, H. V. Small Incision Trabeculectomy Combined With Phacoemulsification and Intraocular Lens Implantation
Meeting abstract
- "Gimbel, H. V., Meyer, D., DeBroff, B. M., Roux, C. W., and Ferensowicz, M. Intraocular pressure response to combined

It is combined cataract/glaucoma surgery study published before April 2000


It is combined cataract/glaucoma surgery study published before April 2000


Data not abstractable

• "Giuffrida, S., Longo, A., Amico, V., Cro, M. G., and Uva, M. G. Efficacy of a New Formulation of Timolol 0.5% in Sodium Hyaluronate Vehicle Administered Once Daily

Meeting abstract

• "Giul'alieva, D. T. and Kasimova, M. D. [Results of sinusotrabeculectomy in glaucoma]

Foreign language

Glucoma e catara: resultados da faceomulsificagåo combinada a trabeculectomia e mitomicina-C. 2000

Foreign language


Does not address any key questions (see below for questions) No original data (e.g., systematic review, narrative review, editorial, letter),

Does not address any key questions

• "Glushko, D. G., Kornienko, V. V., and Sobko, E. G. [The late results of sinusotrabeculectomy in initial open-angle glaucoma]

Foreign language


It is not a RCT and has less than 100 patients


It is a case series


Meeting abstract


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is a case series


Does not address any key questions


It is not a RCT and has less than 100 patients


No original data (e.g., systematic review, narrative review, editorial, letter)


245 (8): 1241; author reply 1243 .

No original data (e.g., systematic review, narrative review, editorial, letter)

- No original data (e.g., systematic review, narrative review, editorial, letter)
- "Goldberg, I. Comparison of tropical travoprost eye drops given once daily and timolol 0.5% given twice daily in patients with open-angle glaucoma or ocular hypertension. J. Glaucoma 2001;10:414-22. J Glaucoma 2002 ;
- No original data (e.g., systematic review, narrative review, editorial, letter)
- It is not a RCT and has less than 100 patients
- Other (specify): pilocarpine
- No original data (e.g., systematic review, narrative review, editorial, letter)
- Data not abstractable
- Other (specify): Combination not included"
- "Goldberg, I., Cunha-Vaz, J., Jakobsen, J. E., Nordmann, J. P., Trost, E., and Sullivan, E. K. Comparison of topical travoprost eye drops given once daily and timolol 0.5% given twice daily in patients with open-angle glaucoma or ocular hypertension
- Medical KQ 3 or KQ 3 and KQ 6 only
- "Goldberg, I., Li, X. Y., Selaru, P., and Paggiarino, D. A 5-year, randomized, open-label safety study of latanoprost and usual care in patients with open-angle glaucoma or ocular hypertension
- Unique comparators
- Data not abstractable
- Wormald 2009
- "Goldenfeld, M., Wong, P., Ruderman, J., Rosenberg, L., Geiser, D., Liebmann, J. L., and Ritch, R. 5-FLUOROURACIL (5-FU) IN PRIMARY TRABECULECTOMY: A PROSPECTIVE, RANDOMIZED STUDY
- Meeting abstract
- "Goni, F. J. 12-week study comparing the fixed combination of brimonidine and timolol with concomitant use of the individual components in patients with glaucoma and ocular hypertension
- Unique comparators
- Unique comparators
- Foreign language
- "Gonzalez Bouchon, Josq D, Gonzalez G., Mariana, Gonzalez, Isabel M, Varas C, Alejandra, and Montecino, M. Isabel. Trabeculoesclerectomía profunda no perforante versus trabeculectomía en glaucoma crónico de ángulo abierto
- Foreign language
- "Gonzalez Bouchon, Joseq Domingo, Gonzalez Gblvez, Mariana, Gonzalez Mathiesen, Isabel, Barra Pantoja, Carmen, Carrasco Zunino, ...
Francisca, Cazenave, Paulette, Grant, Valeria, Barra, Rosa, Pradenas, Ivonne, and Moroni, Magaly. Citostáticos en la cirugía del glaucoma de mal pronóstico, distintas dosis de 5 fluorouracilo, mitomicina C: estudio en 100 casos

- **Foreign language**
- "Gos, R. [Timolol in the treatment of glaucoma (author's transl)]

- **Foreign language**

- **Meeting abstract**

- **Meeting abstract**

- **OAG can’t be analyzed separately**

- **Does not address any key questions**

- **Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

- **Systematic review**

Data not abstractable

Does not address any key questions

Meeting abstract

Data not address any key questions
• "Greff, L., Johnson-Pratt, L., Skobieranda, F., Polis, A., Delucca, P., Kolodny, A., Fletcher, C., and Cassel, D. Comparison of ocular hypotensive effect of cosopt vs concomitant alphagan and timolol

Data not abstractable

Does not address any key questions

It is not a RCT and has less than 100 patients
• "Griesshaber, M. C., Piennaar, A., Olivier, J., and Stegmann, R. Canaloplasty for primary open-angle glaucoma: long-term outcome. Br J Ophthalmol 2010; 94(11); status =Department of Ophthalmology, Medical University of Southern Africa, MEDUNSA, Pretoria, South Africa. mgriesshaber@uhbs.ch): 1478-82.

It is not a RCT and has less than 100 patients

Does not include treatment for open-angle glaucoma (medical, surgical or combined; See addendum for list of interventions), Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Does not address any key questions

Data not abstractable

Other (specify):Apraclonidine

Meeting abstract
• "Gross, Ronald L. Glaucoma: Therapy - New advances in medical management

Foreign language

It is not a RCT and has less than 100 patients

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Guedes, R. A. and Guedes, V. M. [Nonpenetrating deep sclerectomy in Brazil: a 3-year retrospective study]

Foreign language


Other (specify): study design does not match KQ (3)

• "Guedes, Ricardo Augusto Paletta and Guedes, Vanessa Maria Paletta. Resultados press£ricos da esclerectomia profunda nPo penetrante no tratamento do glaucoma primibrio no Ngulo aberto

Foreign language


It is combined cataract/glaucoma surgery study published before April 2000


Does not address any key questions


Foreign language


No original data (e.g., systematic review, narrative review, editorial, letter)


It is a case series

• "Ha, S.-P., Fan, W.-Y., and Yang, Q.-L. A comparative study between biotic amniotic membrane and mitomycin C applied in refractory glaucoma trabecuclcotomy

Foreign language


It is not a RCT and has less than 100 patients


Meeting abstract

• "Halper, L. K., Johnson-Pratt, L., Dobbins, T., and Hartenbaum, D. A comparison of the efficacy and tolerability of 0.5% timolol maleate ophthalmic gel-forming solution QD and 0.5% levobunolol hydrochloride BID in patients with ocular hypertension or open-angle glaucoma. J Ocul Pharmacol Ther 2002;18 (2): 105-13.

Data not abstractable

Does not address any key questions

"Hamacher, T. and Spiegel, D. [Safety and effectiveness of latanoprost (Xalatan) versus fixed combination of dorzolamide and timolol (Cosopt) in patients with open-angel glaucoma]

Meeting abstract


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


It is a case series


It is not a RCT and has less than 100 patients

"Hamard, P., Plaza, L., Kopel, J., Quesnot, S., and Hamard, H. Non penetrating deep sclerectomy and open-angle glaucoma: Mid-term results: Sclerectomie profonde non perforante (SPNP) et glaucome a angle ouvert: Resultats a moyen terme des premiers patients operes

Foreign language


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


No original data (e.g., systematic review, narrative review, editorial, letter)

"Har, T. [Increased iris pigmentation after use of latanoprost in Japanese brown eyes]

Foreign language


It is a case series

"Harasymowycz, P., Hutnik, C. M., Nicolela, M., and Stewart, W. C. Latanoprost versus timolol gel-forming solution once daily in primary open-angle glaucoma or ocular hypertension

Medical KQ 3 or KQ 3 and KQ 6 only


It is a case series


Does not address any key questions

"Harkonen, M. [Bradycardia of an elderly patient caused by Timolol therapy in ocular hypertension]

Foreign language


It is not a RCT and has less than 100 patients


Data not abstractable

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

It is not a RCT and has less than 100 patients

Data not abstractable

No original data (e.g., systematic review, narrative review, editorial, letter)

It is not a RCT and has less than 100 patients

Does not address any key questions
• "Harris, L. S. and Kahanowicz, Y. Pump infusion of pilocarpine. Ophthalmologica 75 ;171 (2): 157-64.

It is not a RCT and has less than 100 patients

It is not a RCT and has less than 100 patients

Data not abstractable
• "Hartenaub, D., Maloney, S., Vaccarelli, L., Liss, C., Wilson, H., and Gormley, G. J. Comparison of dorzolamide and pilocarpine as adjunctive therapy in patients with open-angle glaucoma and ocular hypertension

Excluded drugs
• "Hasegawa, E., Matsuo, N., Sarada, K., and Miyagawa, K. [Timolol ophthalmic solution for the treatment of glaucoma (author's transl)]

Foreign language
• "Hashimoto, M., Okinami, S., and Ohkuma, M. Trabeculectomy: A follow up study Duplicate"

Foreign language
• "Hashimoto, M., Okinami, S., and Ohkuma, M. [Trabeculectomy: a follow up study (author's transl)]

Foreign language

It is a case series
• "Haskold, E. [Acetazolamide in new formulation forms. A randomized cross-over comparison of Glaupax retard capsules and Diamox Sustex]

Foreign language
• "Haskold, E. New acetazolamide formulation. A randomized cross-over comparison of Glaupax retard capsules and Diamox Sustets

Foreign language

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Hatanaka M, Reis A, Sano ME, and Susanna R. Additive intraocular pressure reduction effect of fixed combination of maleate timolol 0.5%/dorzolamide 2% (Cosopt) on monotherapy with latanoprost (Xalatan) in patients with elevated intraocular pressure: a prospective, 4-week, open-label, randomized, controlled clinical trial. Journal of glaucoma 2010 ;19 (5): 331-5.

Data not abstractable
• "Hatanaka, M., Grigera, D. E., Barbosa, W. L., Jordao, M., and Susanna, R. Jr. An eight-week, multicentric, randomized, interventional, open-label, phase 4, parallel comparison of the efficacy and tolerability of the fixed combination of timolol maleate 0.5%/brimonidine tartrate 0.2% versus fixed combination of timolol maleate 0.5%/dorzolamide 2% in patients with elevated intraocular pressure

Medical KQ 3 or KQ 3 and KQ 6 only
• "Hatanaka, M., Reis, A., Sano, M. E., and Susanna, R. Jr. Additive intraocular pressure reduction effect of fixed combination of maleate timolol 0.5%/dorzolamide 2% (Cosopt) on monotherapy with latanoprost (Xalatan) in patients with elevated intraocular pressure: a prospective, 4-week, open-label, randomized, controlled clinical trial Medical KQ 3 only
• "Hattat, N., Caldag, M., and Surel, Z. A double-blind comparison study of local timolol and pindolol in the treatment of primary open angle glaucoma
Foreign language

OAG can’t be analyzed separately
• "HAYES and Inc. Selective laser trabeculoplasty (SLT) using the Selecta 7000 (Lumenis Inc.) for treatment of primary open-angle glaucoma and ocular hypertension (Structured abstract)
Meeting abstract

It is a case series

It is a case series
• "Hazelton, J. R., Whitson, J. T., Henry, C., Terry, S., Hughes, B., and Lee, D. A. Comparison of the Intraocular Pressure Effect and Safety of Dorzolamide 2% Versus Brimonidine 0.2%, Each Given Three Times Daily for Six Weeks in Patients With Primary Open-Angle Glaucoma or Ocular Hypertension
Meeting abstract

No original data (e.g., systematic review, narrative review, editorial, letter)

No original data (e.g., systematic review, narrative review, editorial, letter)
• "Hedman, K., Alm, A., and Gross, R. L. Pooled-data analysis of three randomized, double-masked, six-month studies comparing intraocular pressure-reducing effects of latanoprost and timolol in patients with ocular hypertension Medical KQ 3 only
Meeting abstract

Other (specify):No control group"

It is a case series

It is not a RCT and has less than 100 patients
• "Heijl, A., Leske, M. C., Bengtsson, B., Hyman, L., Bengtsson, B., and Hussein, M. Reduction of intraocular pressure and glaucoma progression: results from the Early Manifest Glaucoma Trial EMGT-Maier

Other (specify):not RCT and doesn't do harms"
• "Heijl, A., Strahlman, E., Sverrisson, T., Brinchman-Hansen, O., Puustjarvi, T., and Tipping, R. A comparison of dorzolamide and timolol in patients with pseudoxfoliation and glaucoma or ocular hypertension
• Medical KQ 3 or KQ 3 and KQ 6 only
  • Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  • Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  • "Heilmann, K. A report on Ocusert: OCUSERT, EIN NEUARTIGES MEDIKAMENTENTRAGERSYSTEM FUR DIE GLAUKOMBEHANDLUNG. 3. MITTEILUNG
duplicate"
  • Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  • "Heilmann, K. and Sinz, U. A report on Ocusert. I: OCUSERT, EIN NEUARTIGES MEDIKAMENTENTRAGERSYSTEM FUR DIE GLAUKOMBEHANDLUNG. I. MITTEILUNG
  • Foreign language
  • "Heimann, K. and Kyrieleis, E. [Retinal detachment from miotic therapy] Foreign language
  • "Heinrich, P. [Miotics and retinal detachment (author's transl)] Foreign language
  • No subjects with open-angle glaucoma, It is a case series
  • "Helal, M. H, El Sayyad, F. F, and El-Hamzawy, H. Manual Small- Incision Mini Nuc Technique for Extracapsular Cataract Extraction (MNT ECCE) and Trabeculectomy Versus Phacotrabeculectomy Meeting abstract
  • "Helton, J. and Storr, F. J. Pilocarpine allergic contact and photocontact dermatitis. Contact Dermatitis 91 ;25 (2): 133-4 .
  • It is a case series
  • Does not address any key questions
  • Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  • Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
  • "Henry, J. C., Kessler, T. L., Mallick, S., Wells, D. T., Hua, S., Landry, T. A., Bergamini, M. V. W., Krueger, D. S., and Travoprost/Timolol Study Group. Comparison of the Safety and IOP-Lowering Efficacy of Travoprost 0.004%/Timolol 0.5% Fixed Combination to the Concomitant Administration of Xalatan® and Timolol 0.5% Meeting abstract
  • Data not abstractable
  • Does not address any key questions
  • Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  • Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
  • "Henry, J. C., Kessler, T. L., Mallick, S., Wells, D. T., Hua, S., Landry, T. A., Bergamini, M. V. W., Krueger, D. S., and Travoprost/Timolol Study Group. Comparison of the Safety and IOP-Lowering Efficacy of Travoprost 0.004%/Timolol 0.5% Fixed Combination to the Concomitant Administration of Xalatan® and Timolol 0.5% Meeting abstract
  • Data not abstractable
• "Herde, J. [On the relevance of the long-time follow-up of the cyclocryotherapy]. Ophthalmologe 99 ;96 (9): 600-4 .
  It is a case series

  It is a case series

• "Herrmann, M. M., Bron, A. M., Creuzot-Garcher, C. P., and Diestelhorst, M. Measurement of Adherence to Brimonidine Therapy for Glaucoma Using Electronic Monitoring
  Unique comparators

  It is a case series

  Meeting abstract

• "Herrera Hernbndez, Norma. Terapqutica en el glaucoma crÉnico de bngulo abierto
  Foreign language

• "Herretes, Samantha, Stangogiannis, Crisante, and Behrens, Ashley. +Queratitis difusa lamellar?: desafortunadamente un diagnÉstico errado
  Foreign language

  It is a case series

  No original data (e.g., systematic review, narrative review, editorial, letter)

• "Heuring, A. H., Hutz, W. W., and Eckhardt, H. B. [Combined phacoemulsification and goniotrepanation in primary open-angle glaucoma and pseudoexfoliation glaucoma - a retrospective analysis]
  Foreign language

• "Heuring, A. H., Hutz, W. W., and Eckhardt, H. B. Combined phacoemulsification and goniotrephination in primary open-angle glaucoma and pseudoexfoliation glaucoma - A retrospective analysis:

  Kombinierte Katarakt-Glaukom-Operation bei primarem chronischen offenwinkelglaukum und Pseudoexfoliationsglaukum - Eine retrospektive analyse
  Foreign language

• "Heuring, A. H., Hutz, W. W., Hoffmann, P. C., and Eckhardt, H. B. [Combined phacoemulsification and goniotrepanation in primary chronic open angle glaucoma and classical pseudoexfoliation glaucoma].
  Ophthalmologe 99 ;96 (5): 312-8 .
  It is a case series

• "Hickey-Dwyer, M., Campbell, S. H., and Harding, S. Doubled-masked three-period crossover investigation of metipranolol in control of raised intraocular pressure
  Meeting abstract

• "Higginbotham, E. J and AGN 192024 Study Group, 1. 1-year comparison of the new prostamide AGN 192024 with timolol for the management of glaucoma and ocular hypertension
  Meeting abstract

• "Higginbotham, E. J, Goldberg, I., Schuman, J. S, Gross, R. L, Vandenburg, A. M, and Whitcup, S. M. One-year comparison of bimatoprost with timolol in patients with glaucoma or ocular hypertension
  Meeting abstract

• "Higginbotham, E. J., Feldman, R., Stiles, M., and Dubiner, H. Latanoprost and timolol combination therapy vs monotherapy: one-year randomized trial
  Medical KQ 3 or KQ 3 and KQ 6 only

• "Higginbotham, E. J., Gordon, M. O., Beiser, J. A., Drake, M. V., Bennett, G. R., Wilson, M. R., and Kass, M. A. The Ocular Hypertension Treatment Study: topical medication delays or prevents primary open-angle glaucoma in African American individuals
  Medical KQ 3 only

  Does not address any key questions

• "Higginbotham, E. J., Olander, K. W., Kim, E. E., Grunden, J. W., Kwok, K. K., and Tressler, C. S. Fixed combination of latanoprost and timolol vs individual components for primary open-angle glaucoma or ocular

• Other (specify): not FDA approved

• "Higginbotham, E. J., Olander, K. W., Kim, E. E., Grunden, J. W., Kwok, K. K., and Tressler, C. S. Fixed combination of latanoprost and timolol vs individual components for primary open-angle glaucoma or ocular hypertension: a randomized, double-masked study

• Systematic review

• "Higginbotham, E. J., Olander, K. W., Kim, E. E., Grunden, J. W., Kwok, K. K., and Tressler, C. S. Fixed combination of latanoprost and timolol vs individual components for primary open-angle glaucoma or ocular hypertension: a randomized, double-masked study.

• OAG can’t be analyzed separately


• OAG can’t be analyzed separately


• OAG can’t be analyzed separately


• OAG can’t be analyzed separately

• "Hillery, M. and Blake, J. Pilocarpine sine miosis in primary open angle glaucoma [abstract]

• Abstract only


• Does not include treatment for open-angle glaucoma (medical, surgical or combined)


• Does not include treatment for open-angle glaucoma (medical, surgical or combined)


• It is a case series


• It is not a RCT and has less than 100 patients


• No original data (e.g., systematic review, narrative review, editorial, letter)


• Does not address any key questions


• Does not include treatment for open-angle glaucoma (medical, surgical or combined)


• It is a case series

• "Hodge, W., Damji, K. F, Bovell, A., and Buhrmann, R. R. Highly Successful SLT is Independent of Glaucoma Type, Previous Surgery, Medical Therapy, or Glaucoma Risk Factors

• Meeting abstract


• Does not address any key questions

Does not address any key questions


It is not a RCT and has less than 100 patients

- "Hollo, G., Chisletia, D., Petkova, N., Cvenkel, B., Lihneova, I., Izgi, B., Berta, A., Szaflak, J., Turacli, E., and Stewart, W. C. The efficacy and safety of timolol maleate versus brinzolamide each given twice daily added to travoprost in patients with ocular hypertension or primary open-angle glaucoma

Medical KQ 3 only


Meeting abstract


Does not address any key questions


Other (specify): Study design does not match KQ


No original data (e.g., systematic review, narrative review, editorial, letter)

- "Holmwood, P., Chase, D., Ruderman, I., Rosenberg, L., and Krupin, T. EFFECT OF APRACLONIDINE DOSAGE ON ARGON LASER TRABECULOPLASTY (ALT) INDUCED INCREASE IN INTRAOCULAR PRESSURE (IOP)

Meeting abstract

- "Hommer, A. A double-masked, randomized, parallel comparison of a fixed combination of bimatoprost 0.03%/timolol 0.5% with non-fixed combination use in patients with glaucoma or ocular hypertension. Eur J Ophthalmol 2007;17(1):53-62.

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

- "Hommer, A. B, Mertz, B., Schwenninger, C., Yannoulis, N., Kapik, B., and The Unoprostone Study Group. Efficacy and safety of unoprostone, dorzolamide, and brimonidine in adjunctive therapy to timolol in patients with primary open-angle glaucoma and ocular hypertension

Meeting abstract

- "Hommer, A., Kapik, B., and Shams, N. Unoprostone as adjunctive therapy to timolol: a double masked randomised study versus brimonidine and dorzolamide

Excluded drug

- "Hommer, A., Nowak, A., and Huber, S. V. A multidose, double-masked, parallel active treatment controlled multicenter study of 0.25% timolol in Gelrite once daily versus 0.25% timolol solution twice

Duplicate "

- "Hommer, A., Nowak, A., and Huber-Spitzy, V. [Multicenter double-blind study with 0.25% timolol in Gelrite (TG) once daily vs. 0.25% timolol solution (TS) twice daily. German Study Group]. Ophthalmologe 95; 92 (4): 546-9.

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

- "Hommer, A., Nowak, A., and Huber-Spitzy, V. A multidose, double-masked, parallel active treatment controlled multicenter study of 0.25% timolol in Gelrite once daily versus 0.25% timolol solution twice: MULTIZENTRISCHE DOPPELBLINDSTUDIE MIT 0,25% TIMOLOL IN GELRITE (TG) 1MAL TÄGLICH VS. 0,25% TIMOLOL-LOSUNG (TS) 2MAL TÄGLICH

Duplicate "


No original data (e.g., systematic review, narrative review, editorial, letter)


It is a case series


Other (specify): Study design does not match KQ


It is combined cataract/glaucoma surgery study published before April 2000


Other (specify): Study design does not match KQ

"Honrubia, F. M., Larsson, L. I., and Spiegel, D. A comparison of the effects on intraocular pressure of latanoprost 0.005% and the fixed combination of dorzolamide 2% and timolol 0.5% in patients with open-angle glaucoma

Medical KQ 3 only

"Honrubia, F., Garcia-Sanchez, J., Polo, V., de la Casa, J. M., and Soto, J. Conjunctival hyperaemia with the use of latanoprost versus other prostaglandin analogues in patients with ocular hypertension or glaucoma: a meta-analysis of randomised clinical trials

Systematic review


OAG can’t be analyzed separately


It is combined cataract/glaucoma surgery study published before April 2000

"Horven, I. [Timolol Eyedrops] Foreign language


No original data (e.g., systematic review, narrative review, editorial, letter)

"Hostyn, P., Le Rebeller, M. J., and Trinquand, C. Fixed combination of carteolol and pilocarpine eye-drops: A double-blind randomized cross-over trial versus carteolol alone on intra-ocular pressure Duplicate"


Other (specify): Study design does not match KQ


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

Other (specify): not FDA approved

- "Hu, C. [Long-term effect of domestic timolol on patients with primary open-angle glaucoma]
- Foreign language
- Does not address any key questions
- OAG can’t be analyzed separately
- It is not a RCT and has less than 100 patients
- Foreign language
- Meeting abstract
- "Huertas A., Jeanette, Anuch J., Patricio, and Adrianzen Barreto, Rosa. Estudio comparativo entre trabeculectomía y sinusotrabeculectomía en el glaucoma primario de angulo abierto
- Foreign language
- "Hughes, B. A., Bacharach, J., Craven, E. R., Kabaek, M. B., Mallick, S., Landry, T. A., and Bergamini, M. V. A three-month, multicenter, double-masked study of the safety and efficacy of travoprost 0.004%/timolol 0.5% ophthalmic solution compared to travoprost 0.004% ophthalmic solution and timolol 0.5% dose concomitantly in subjects with open angle glaucoma or ocular hypertension
- Non-FDA-approved drug combination
- "Hughes, B. A., Juzych, M. S., Pettigrew, S. C., Sullivan, E. K., Landry, T. A., and Robertson, S. M. A Comparison of Travoprost 0.004%/Timolol 0.5% Ophthalmic Solution and the Concomitant Administration of TRAVATAN® and Timolol 0.5%
- Meeting abstract
- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
- Data not abstractable
- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
- Data not abstractable
- "Hugkulstone, C. E. Two-year follow-up of intra-ocular pressure control with long duration argon laser trabecuoplasty
- Rolim de Moura 2009
- It is not a RCT and has less than 100 patients
- It is not a RCT and has less than 100 patients
- Does not address any key questions
- Other (specify): Not an intervention of interest
- "Huo, Q., Shen, Q., Zhang, D. M., and Zhang, R. T. [Effect of pricking blood at Neiyingxiang (EX-HN 9) on the intraocular pressure of patients with primary open angle glaucoma]
- Foreign language
- It is combined cataract/glaucoma surgery study published before April 2000
- It is a case series
- o original data (e.g., systematic review, narrative review, editorial, letter)
- "Hutzelmann, J. E., Polis, A. B., Michael, A. J., and Adamsons, I. A. A comparison of the efficacy and tolerability of dorzolamide and acetazolamide as adjunctive therapy to timolol
- Duplicate "
- ata not abstractable
- "Hutzelmann, J., Owens, S., Shedden, A., Adamsons, I., and Vargas, E. Comparison of the safety and efficacy of the fixed combination of dorzolamide/timolol and the concomitant administration of dorzolamide and timolol: A clinical equivalence study
- Duplicate "
- "Hutzelmann, J., Owens, S., Shedden, A., Adamsons, I., and Vargas, E. Comparison of the safety and efficacy of the fixed combination of dorzolamide/timolol and the concomitant administration of dorzolamide and timolol: a clinical equivalence study. International Clinical Equivalence Study Group
- edical KQ 3 or KQ 3 and KQ 6 only
- CONCOMITANT ADMINISTRATION OF TIMOLOL AND DORZOLAMIDE
- eeting abstract
- "Hutzelmann, J., Snyder, E., Tipping, R., and Adamsons, I. COMPARISON OF THE IOP LOWERING EFFECT OF 2.0% DORZOLAMIDE T.I.D. (TRUSOPT*) IN PATIENTS WITH LIGHT AND DARK IRIDES
- eeting abstract
- ata not abstractable
- o original data (e.g., systematic review, narrative review, editorial, letter) Data not abstractable, No original data (e.g., systematic review, narrative review, editorial, letter)
- "Iakovlev, A. A. and Lenkevich, M. M. [Use of pilocarpine in a polyvinyl alcohol film for the treatment of glaucoma patients]
- foreign language
- t is not a RCT and has less than 100 patients
- "Ignat, F., Damian, C., Manescu, R., and Perovic, I. [Neuroprotective effect of Betoptic S-considerations after 18 months of treatment]
- foreign language
- Meeting abstract
- Does not address any key questions
• "Imamoto, N., Kim, J., Chang, F., and Kim, C. COMPARISON BETWEEN TIMOPTIC-XE QD AND TIMOLOL SOLUTION BID ON IOP AT THE 23RD HOUR

• Meeting abstract

• Foreign language

• Does not address any key questions

• It is not a RCT and has less than 100 patients

• Data not abstractable

• Does not address any key questions

• It is a case series gives an estimate of likelihood of pigmentation It is a case series
• "Indar, A. R, Poinoosawmy, D., and Hitchings, R. A. Effect of medical treatment or surgery on intraocular pressure and ocular blood flow in normal tension glaucoma

• Meeting abstract

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• It is not a RCT and has less than 100 patients

• Other (specify): Unoprostone, nipradilol, dipirefvin and outcomes not given separately

• It is not a RCT and has less than 100 patients
• "Inoue, K., Wakakura, M., Inoue, J., Matsuo, H., Harag, T., and Tomita, G. [Adverse reaction after use of latanoprost in Japanese glaucoma patients]

• Foreign language
• "Inoue, K., Wakakura, M., Inouye, J., and Tomita, G. Effect of levobunolol switched from timolol gel-forming solution

• Foreign language

• OAG can’t be analyzed separately

• Foreign language

• OAG can’t be analyzed separately

• Does not address any key questions


• It is not a RCT and has less than 100 patients

• "Ishikawa, T., Okisaka, S., Hiwatari, S., Taketani, P., and Sugimachi, Y. [Pilocarpine, carbachol and carteolol on open-angle glaucoma and ocular hypertension (author's transl)]

• Foreign language

• "Iwakiri, R., Kobayashi, H., Kobayashi, K., and Okinami, S. Addition of topical bunazosin to latanoprost in multiple medical treatment for glaucoma

• Foreign language


• No subjects with open-angle glaucoma

• "Jacobi, P. C., Dietlein, T. S., and Kriegstein, G. K. [Cataract surgery in pseudoexfoliation glaucoma: A combination with trabeculectomy, aspiration of the trabeculum or bilateral procedure]

• Meeting abstract

• "Jacobi, P. C., Dietlein, T. S., and Kriegstein, G. K. Comparative study of trabecular aspiration vs trabeculectomy in glaucoma triple procedure to treat pseudoexfoliation glaucoma. Arch Ophthalmol 99;

• 117 (10): 1311-8.

• It is combined cataract/glaucoma surgery study published before April 2000


• It is combined cataract/glaucoma surgery study published before April 2000


• Data not abstractable


• It is not a RCT and has less than 100 patients


• Other (specify): unoprostone

• "Januleviciene, I., Ehrlich, R., Siesky, B., Nedzelskiene, I., and Harris, A. Visual function, optic nerve structure, and ocular blood flow parameters after 1 year of glaucoma treatment with fixed combinations

• Non-FDA-approved drug combination

• "Januleviciene, I., Ehrlich, R., Siesky, B., Nedzelskiene, I., and Harris, A. Visual function, optic nerve structure, and ocular blood flow parameters after 1 year of glaucoma treatment with fixed combinations

• Duplicate

• "Januleviciene, I., Harris, A., Kagemann, L., Siesky, B., and McCranor, L. A comparison of the effects of dorzolamide/timolol fixed combination versus latanoprostone on intraocular pressure and pupil size in primary open-angle glaucoma patients

• Medical KQ 3 only

• "Januszewski, T., Nowakowska-Maziarz, M., and Kliszczewski, D. [Simultaneous cataract and glaucoma surgery. Selection of trabeculectomy site]

• Foreign language


• 50 (4): 1718-25.
• Does not address any key questions
• Data not abstractable
• Foreign language
• "Javitt, J. and Goldberg, I. Comparison of the clinical success rates and quality of life effects of brimonidine tartrate 0.2% and Betaxolol 0.25% Suspension in patients with open-angle glaucoma and ocular hypertension. Brimonidine Outcomes Study Group II
• Medical KQ 3 only
• "Javitt, J. C. Clinical Effectiveness and Quality of Life Associated with Brimonidine versus Betaxolol as Monotherapy for Glaucoma and Ocular Hypertension (OHT)
• Meeting abstract
• No original data (e.g., systematic review, narrative review, editorial, letter)
• "Javitt, J. C., Schiffman, R. M., Atlas, W., Baum, K. J., Cookem, D. L., DuBiner, H. B., Katz, J. L., Kupin, T., Memmen, J. E., Mundorf, T. K., Nelson, E., Offenberg, H., Schenker, H. I., Sharpe, E., Stevenson, D., Stewart, W. C., Tanchel, N., and Whitaker, R. Clinical success and quality of life with brimonidine 0.2% or Timolol 0.5% used twice daily in glaucoma or ocular hypertension: A randomized clinical trial
• Duplicate "
• "Javitt, J. THE CLINICAL SUCCESS RATE AND QUALITY OF LIFE ASSESSMENT OF BRIMONIDINE TARTRATE 0.2% COMPARED WITH TIMOLOL 0.5%, ADMINISTERED TWICE DAILY IN PATIENTS WITH PREVIOUSLY UNTREATED OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION
• Meeting abstract
• "Jay, J. L. and Allan, D. The benefit of early trabeculectomy versus conventional management in primary open angle glaucoma relative to severity of disease. Eye (Lond) 89 ;3 ( Pt 5) : 528-35 .
• Does not address any key questions
• Data not abstractable
• Other (specify):Not interested in studies comparing the ordering of interventions"
• "Jayamanne, D. G., Kostakis, A., and Phelan, P. S. The outcome of 2.3 mm incision combined phacoemulsification, trabeculectomy and lens implantation of non-foldable intraocular lenses. Eye (Lond) 97 ;11 ( Pt 1) : 91-4 .
• It is combined cataract/glaucoma surgery study published before April 2000
• "Jayaprakasam, A. and Ghazi-Nouri, S. Periorbital fat atrophy - an unfamiliar side effect of prostaglandin analogues. Orbit 2010 ; 29 (6; status =Ophthalmology Department, Broomfield Hospital, Court Road, Chelmsford, Essex. amuradhajayaprakasam@hotmail.com): 357-9 .
• It is a case series
• OAG can’t be analyzed separately
• OAG can’t be analyzed separately
• "Jiang, B. and Jiang, Y. Q. [Long-term follow-up of mitomycin C in trabeculectomy]
• Foreign language
• "Jiang, Y.-L., Yuan, Z.-L., Zhang, W.-Z., Zhang, W.-W., and Li, Y. The clinical study on the change of corneal endothelial cells after viscocanalostomy and trabeculectomy

• Foreign language

• It is a case series

• It is not a RCT and has less than 100 patients

• OAG can’t be analyzed separately

• No original data (e.g., systematic review, narrative review, editorial, letter)

• It is not a RCT and has less than 100 patients, Data not abstractable

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Jonas, J. B. Systemic carbonic anhydrase inhibitors have been used to reduce intraocular pressure in glaucoma patients unresponsive to other anti glaucomatous medical treatments. J Glaucoma 2001 ; 10 (5): 441.

• No original data (e.g., systematic review, narrative review, editorial, letter)

• It is a case series

• It is a case series

• No original data (e.g., systematic review, narrative review, editorial, letter)
• "Jonescu-Cuypers, C. P, Roessler, G., Hellmich, M., and Diestelhorst, M. Comparing Efficacy of Xalacom&trade; and Cosopt&trade; on Intraocular Pressure and Optic Nerve Head Perfusion in Glaucoma Patients: A Randomized Cross-Over Trial

• Meeting abstract
• "Jonescu-Cuypers, C. P., Jacobi, P. C., Konen, W., and Kriegstein, G. K. [Primary viscocanalostomy versus trabeculectomy in caucasian patients with open-angel glaucoma: a prospective randomised trial]

• Meeting abstract

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• Medical KQ 3 or KQ 3 and KQ 6 only
Does not include treatment for open-angle glaucoma (medical, surgical or combined)

"Joyce, P. W. and Mills, K. B. A COMPARISON OF EQUIVALENT DOSAGE FORMS OF ACETAZOLAMIDE IN PRIMARY OPEN ANGLE GLAUCOMA

Meeting abstract


It is not a RCT and has less than 100 patients


No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)

"Joyce, P. W., Mills, K. B., Richardson, T., and Mawer, G. E. Equivalence of conventional and sustained release oral dosage formulations of acetazolamide in primary open angle glaucoma

Medical KQ 3 or KQ 3 and KQ 6 only

"Juhas, T. [Argon laser trabeculoplasty--long-term results]

Foreign language

"Jurwoski, P. and Gos, R. [Effectiveness of the combined surgical treatment for glaucoma and cataract]

Foreign language


It is a case series


Meeting abstract


It is a case series

"Kaback, M., Scoper, S. V., Arzeno, G., James, J. E., Hua, S. Y., Salem, C., Dickerson, J. E., Landry, T. A., and Bergamini, M. V. Intraocular pressure-lowering efficacy of brinzolamide 1%/timolol 0.5% fixed combination compared with brinzolamide 1% and timolol 0.5%. Ophthalmology 2008 ;115 (10): 1728-34, 1734.e1-2.

Does not include treatment for open-angle glaucoma (medical, surgical or combined)


It is a case series

"Kabuni, M., Maertens, K., and Missotten, L. [The effect of high-percent pilocarpine in the pigmented eye]

Foreign language


It is not a RCT and has less than 100 patients


It is a case series


It is not a RCT and has less than 100 patients


Does not address any key questions
It is not a RCT and has less than 100 patients


It is a case series


Does not address any key questions

• "Kaiya, T., Yuguchi, T., Sawaguchi, S., and Iwata, K. NON-PENETRATING LAMELLAR TRABECULAECTOMY WITH MMC APPLICATION FOR OPEN ANGLE GLAUCOMA
Meeting abstract


It is a case series

• "Kalnak, J., Ripkin, D., and Medendorp, S. A RANDOMIZED CONTROLLED TRIAL OF THE MOLTENO IMPLANT WITH AND WITHOUT MITOMYCIN-C
Meeting abstract


No subjects with open-angle glaucoma


Does not address any key questions


Other (specify):pilocarpine

• "Kaluzny, J. J., Szaflak, J., Czechowicz-Janicka, K., Kaluzny, J., Orzalkiewicz, A., Zaleska-Zmijewska, A., Krajewska, M., Stewart, J. A., Leech, J. N., and Stewart, W. C. [Timolol 0.5%/dorzolamide 2% fixed combination versus timolol 0.5%/pilocarpine 2% fixed combination in primary open-angle glaucoma or ocular hypertensive patients] OAG can’t be analyzed separately

Foreign language


Other (specify):pilocarpine

• "Kamal, D., Garway-Heath, D., Ruben, S., O'Sullivan, F., Bunce, C., Viswanadhan, A., Franks, W., and Hitchings, R. Results of the betaxolol versus placebo treatment trial in ocular hypertension Vass-2007


Medical KQ 3 only

• "Kampik, A. and European Study Group. A COMPARISON OF THE EFFICACY AND SAFETY OF LATANOPROST (XALATAN®) WITH BRIMONIDINE (ALPHAGAN®) IN PATIENTS WITH OPEN ANGLE GLAUCOMA AND OCULAR HYPERTENSION
Meeting abstract

• "Kampik, A., Arias-Puente, A., O'Bratt, D. P., and Vuori, M. L. Intraocular pressure-lowering effects of latanoprost and brimonidine therapy in patients with open-angle glaucoma or ocular hypertension: a randomized observer-masked multicenter study

Medical KQ 3 or KQ 3 and KQ 6 only

preventing intraocular pressure spikes following phacoemulsification in glaucoma patients. Eur J Ophthalmol 2010 ;
- 20 (6; status =1st Ophthalmology Department, Ophthalmiatrion Eye Hospital of Athens, Sina 2, Athens, Greece. artemiskandarakis@yahoo.gr): 994-9 .

Does not address any key questions
- "Kang, R. X. [The intraocular pressure depressive effect of puerarin]. Zhonghua Yan Ke Za Zhi 93 ;

Does not address any key questions

OAG can’t be analyzed separately
- "Kano, K., Kuwayama, Y., and Mizunoya, H. [Clinical results of fornix-based trabeculectomy with a scleral tunnel]

Foreign language

It is a case series
- "Kaplan-Messas, A., Cohen, Y., Blumenthal, E. Z., and Avni, I. Trabeculectomy and photo-trabeculectomy with and without peripheral iridectomy

Duplicate

Meeting abstract
- "Karlik, J. S., Baker, K. S., and Dutt, R. M. COMPARISON OF LATANOPROST VERSES APRACLOPDINE AS PRETREATMENT IN EYES UNDERGOING ARGON LASER TRABECULOPLASTY

Meeting abstract
- "Karlik, J. S., Barber, J. C., Humphreys, A., and Dutt, R. M. THE COMPARISON OF LATANOPROST VERSES APRACLOPDINE AS PRETREATMENT IN EYES UNDERGOING ARGON LASER TRABECULOPLASTY

Meeting abstract
- "Karray, H. and Demailly, P. [Comparative study of long-term tonometry results of 2 surgical technics combining extraction of the crystalline lens and trabeculectomy]. Bull Soc Ophthalomol Fr 88 ;

It is combined cataract/glaucoma surgery study published before April 2000

Foreign language

It is not a RCT and has less than 100 patients

It is not a RCT and has less than 100 patients
- 24 (3): 172-5 .

OAG can’t be analyzed separately

Other (specify): Duplicate for RefId 9468"

No original data (e.g., systematic review, narrative review, editorial, letter)

"Kass, M. A. Timolol treatment prevents or delays glaucomatous visual field loss in individuals with ocular hypertension: a five-year, randomized, double-masked, clinical trial. Trans Am Ophthalmol Soc 89 ; 87 : 598-618.

Other (specify):Duplicate for RefId 9468"


No original data (e.g., systematic review, narrative review, editorial, letter)


Other (specify):Study design does not match KQ


Maier, 2005


Data not abstractable


Other (specify):Duplicate for RefId 9468"


Medical KQ 3 or KQ 3 and KQ 6 only


OAG can’t be analyzed separately


Unique comparators


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

"Katz LJ, Cohen JS, Batoosingh AL, Felix C, Shu V, and Schiffman RM. Twelve-month, randomized, controlled trial of bimatoprost 0.01%, 0.0125%, and 0.03% in patients with glaucoma or ocular hypertension. American journal of ophthalmology 2010 ;149 (4): 661-671.e1.

OAG can’t be analyzed separately

"Katz, I. M. [Efficacy and safety of long-term maintenance treatment with timolol ophthalmic solution in chronic open-angle glaucoma (author's transl)]

Foreign language


Does not address any key questions

Meeting abstract

"Katz, L. J. and Brimonidine Outcomes Study Group. CLINICAL SUCCESS RATE AND QUALITY OF LIFE OF BRIMONIDINE 0.2% BID VERSUS TIMOLOL 0.5% BID IN NAIVE GLAUCOMA PATIENTS"

Meeting abstract

"Katz, L. J. Brimonidine tartrate 0.2% Twice daily vs timolol 0.5% Twice daily: 1- year results in glaucoma patients

Medical KQ 3 or KQ 3 and KQ 6 only

"Katz, L. J. Brimonidine tartrate 0.2% twice daily vs timolol 0.5% twice daily: 1-year results in glaucoma patients. Brimonidine Study Group

Medical KQ 3 or KQ 3 and KQ 6 only

"Katz, L. J. Twelve-month evaluation of brimonidine-purite versus brimonidine in patients with glaucoma or ocular hypertension

Unique comparators


It is not a RCT and has less than 100 patients

"Katz, L. J., Cohen, J. S., Batoosingh, A. L., Felix, C., Shu, V., and Schiffman, R. M. Twelve-month, randomized, controlled trial of bimatoprost 0.01%, 0.0125%, and 0.03% in patients with glaucoma or ocular hypertension

Unique comparators


Meeting abstract


Other (specify):case report of harm"


No original data (e.g., systematic review, narrative review, editorial, letter)


OAG can't be analyzed separately

"Kazakovskaya, E. L. [Laser trabeculoplasty and the status of the crystalline lens in open-angle glaucoma]

Foreign language

"Kazakovskaya, E. L. and Akopian, V. S. [Effect of laser therapy on visual function in primary open-angle glaucoma]

Foreign language


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not address any key questions


Other (specify):pilocarpine


It is not a RCT and has less than 100 patients


It is a case series


Data not abstractable


D-84
• It is combined cataract/glaucoma surgery study published before April 2000
• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• It is not a RCT and has less than 100 patients
• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Kessler, C. and Bishop, K. FIXED DRUG COMBINATION FOR GLAUCOMA TREATMENT
• Meeting abstract
• OAG can’t be analyzed separately
• It is a case series
• Foreign language
• Data not abstractable
• "Khata, A., Craven, E. R., Mundorf, T. K., Liu, C. C., and Batoosingh, A. A Randomized, Controlled Comparison of Conjunctival Hyperemia in Patients Treated with Bimatoprost 0.01% or Vehicle Who Were Previously Controlled on Latanoprost
• Meeting abstract
• "Khaw, P. T, Grehn, F. J, and Overton, B. M. A Multicentre, Double-Masked, Randomised, Placebo-Control Study to Evaluate the Efficacy, Safety, and Tolerability of Subconjunctival Injections of 100 µG CAT-152 Human Anti-Tgfß2 Monoclonal Antibody as an Agent to Modulate Wound Healing Following First Time Trabeculectomy (Study 0102)
• Meeting abstract
• Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• No original data (e.g., systematic review, narrative review, editorial, letter)
• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Kim, C. Y., Hong, S., and Seong, G. J. Brimonidine 0.2% versus brimonidine Purite 0.15% in Asian ocular hypertension
• Unique comparators
• Data not abstractable
• "Kim, H. J. and Cho, B. J. Long-Term Effect of Latanoprost on Central Corneal Thickness in Normal Tension Glaucoma. J Ocul Pharmacol Ther 2010 ;
• Does not address any key questions
• "Kim, H. K., Kim, C. Y., Lim, C. S., Lee, J. H., and Hong, Y. J. EFFECTS ON INTRAOCULAR PRESSURE AND ADVERSE EFFECTS OF LATANOPROST. A COMPARISON WITH TIMOLOL. PASE III STUDY IN KOREA
• Meeting abstract
• It is not a RCT and has less than 100 patients
• It is combined cataract/glaucoma surgery study published before April 2000
• It is a case series
• Meeting abstract
• Does not address any key questions
• 22 (1): 37-42.
• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Kinshuck, D. Glauline (metipranolol) induced uveitis and increase in intraocular pressure. Br J Ophthalmol 91 ;75 (9): 575.
• It is a case series
• It is combined cataract/glaucoma surgery study published before April 2000
• Kirwan 2009
• "Kirwan, J. F., Rennie, C., and Evans, J. R. Beta radiation for glaucoma surgery
• Systematic review
• Other (specify):foreign language"
• "Kitazawa, Y. An open-label multicenter study on the efficacy and safety of topical use of latanoprost for 156 weeks
• Foreign language
• Does not address any key questions
• "Kitazawa, Y. Multicenter double-blind comparison of carteolol and timolol in primary open-angle glaucoma and ocular hypertension. ADV. THER. 93 ;
• 10 (3): 95-131.
• Other (specify):Age distributions show >5% below 40"
• "Kitazawa, Y. Phase III comparative study of MK-507 ophthalmic solution in primary open-angle glaucoma and ocular hypertension. FOLIA OPHTHALMOL. JPN. 94 ;45 (9): 1023-1033.
• Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• It is not a RCT and has less than 100 patients
• "Kitazawa, Y., Azuma, I., Iwata, K., Tsukahara, S., Shiose, Y., Araie, M., Shirato, S., Mizogami, K., Mishima, H., Futa, R., and Komemushi, S.
Dorzolamide, A Topical Carbonic Anhydrase Inhibitor: A Two-Week Dose-Response Study in Patients with Glaucoma or Ocular Hypertension.
J Glaucoma 94 ;
• 3 (4): 275-279.

• Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• Does not address any key questions
  • 109 (12): 1693-8.
• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• It is not a RCT and has less than 100 patients

• Does not address any key questions
• “Kittanarong, N., Zhao, Y., Netland, P. A., and Kent, A. R. Efficacy of latanoprost and timolol maleate in black and white patients

• Medical KQ 3 only

• Does not address any key questions

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• Other (specify): pilocarpine

• Does not address any key questions

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• “Kobayashi, H. and Kobayashi, K. Viscocanalostomy vs. Trabeculectomy with Mitomycin: A Randomized Comparison of Safety and 10P-lowering Effect

• Meeting abstract
• “Kobayashi, H., Iwakiri, R., Kobayashi, K., and Okinami, S. [Hypotensive effect of unoprostone as adjunct to latanoprost during multiple drug therapy for glaucoma]

• Foreign language

• Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Kobayashi, H., Kobayashi, K., and Okinami, S. A comparison of the intraocular pressure-lowering effect and safety of viscocanalostomy and trabeculectomy with mitomycin C in bilateral open-angle glaucoma

Cheng 2009 and Chai 2010

• "Kobayashi, H., Kobayashi, K., and Okinami, S. Efficacy of bunazosin hydrochloride 0.01% as adjunctive therapy of latanoprost or timolol. J Glaucoma 2004;13 (1): 73-80.

Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Does not address any key questions

• "Kobeeva, V. I., Kolotkova, A. I., and Golovachev, I. u. F. Clinical characteristics and results of conservative treatment of glaucoma with pseudoexfoliations

Foreign language


It is a case series


Meeting abstract

• "Koeller, A. U., Pillunat, L. E., Schmidt, J., Boehm, A. G., and Allmeier, H. J. EFFECT OF DIFFERENT BETA-BLOCKERS ON OCULAR HEMODYNAMICS, HYDRODYNAMICS AND OPTC NERVE HEAD BLOOD FLOW IN GLAUCOMA PATIENTS

Meeting abstract

• "Koerber, N. J. Canaloplasty in One Eye Compared With Viscocanalostomy in the Contralateral Eye in Patients With Bilateral Open-angle Glaucoma. J Glaucoma 2011;

It is a case series

• "Kohler, U. and Schmoger, E. [Follow-up of cases of suspected glaucoma (author's transl)]. Klin Monbl Augenheilkld 75;

166 (1): 11-7.

Does not address any key questions

• "Kolesnikova, L. N. [Formation of the pathway for outflow of intraocular fluid after trabeculectomy]

Foreign language


Does not address any key questions


Other (specify):Not a comparison of interest

• "Koller, T. L. F., Sturmer, J., and Gloor, B. Risk factors for trabeculectomy failure: Risikofaktoren fur das versagen einer trabekulektomie

Duplicate"

• "Koller, T. L., Sturmer, J., and Gloor, B. [Risk factors for trabeculectomy failure]

Foreign language


No original data (e.g., systematic review, narrative review, editorial, letter)

• "Konstas, A. G P, Holmes, K. T, and Stewart, W. C. A compariosn of the efficacy and safety of latanoprost 0.005% every evening versus timolol/dorzolamide fixed combination twice daily

Meeting abstract

• "Konstas, A. G. P., Lake, S., Maltezos, T., Holmes, K. T., and Sweat, W. C. LATANOPROST COMPARED TO PILOCARPINE AS THIRD LINE THERAPY IN EXFOLIATION GLAUCOMA

Meeting abstract

• "Konstas, A. G. P., Mantziris, D. A., Maltezos, A., Cate, E. A., and Stewart, W. C. Comparison of 24 hour control with Timoptic(registered trademark) 0.5% and Timoptic-XE(TM) 0.5% in exfoliation and primary open-angle glaucoma. Acta Ophthalmol. Scand. 99;

77 (5): 541-543.
It is not a RCT and has less than 100 patients
Intraocular pressure and safety in glaucoma patients switching to latanoprost/timolol maleate fixed combination from mono- and adjunctive therapies

Excluded drug

Does not address any key questions

Does not address any key questions

Stewart 2010

"Konstas, A. G., Hollo, G., Mikropoulos, D., Tsironi, S., Haidich, A. B., Embeslidis, T., Georgiadou, I., Irkec, M., and Melamed, S. Twenty-four-hour intraocular pressure control with bimatoprost and the bimatoprost/timolol fixed combination administered in the morning, or evening in exfoliative glaucoma

Non-FDA-approved drug combination

Does not address any key questions

Other (specify): applies to KQ3 but not RCT
"Konstas, A. G., Katsimbris, J. M., Lallos, N., Boukaras, G. P., Jenkins, J. N., and Stewart, W. C. Latanoprost 0.005% versus bimatoprost 0.03% in primary open-angle glaucoma patients

Stewart 2010


Unique comparators
"Konstas, A. G., Kozobolis, V. P., Katsimpris, I. E., Boboridis, K., Koukoula, S., Jenkins, J. N., and Stewart, W. C. Efficacy and safety of latanoprost versus travoprost in exfoliative glaucoma patients

Medical KQ 3 or KQ 3 and KQ 6 only
"Konstas, A. G., Kozobolis, V. P., Lallos, N., Christodoulakis, E., Stewart, J. A., and Stewart, W. C. Daytime diurnal curve comparison between the fixed combinations of latanoprost 0.005%/timolol maleate 0.5% and dorzolamide 2%/timolol maleate 0.5%. Eye (Lond) 2004;18 (12): 1264-9

Other (specify): applies to KQ3 but not RCT

"Konstas, A. G., Kozobolis, V. P., Tersis, I., Leech, J., and Stewart, W. C. The efficacy and safety of the timolol/dorzolamide fixed combination vs latanoprost in exfoliation glaucoma

Just KQ 2 and/or 5
"Konstas, A. G., Kozobolis, V. P., Tsironi, S., Makridaki, I., Efremova, R., and Stewart, W. C. Comparison of the 24-hour intraocular pressure-lowering effects of latanoprost and dorzolamide/timolol fixed combination after 2 and 6 months of treatment

Stewart 2010


Other (specify): not approved combi

"Konstas, A. G., Lake, S., Economou, A. I., Kaltos, K., Jenkins, J. N., and Stewart, W. C. 24-Hour Control With The Latanoprost/Timolol Maleate Fixed Combination versus Timolol Maleate

Meeting abstract
• "Konstas, A. G., Lake, S., Maltezos, A. C., Holmes, K. T., and Stewart, W. C. Twenty-four hour intraocular pressure reduction with latanoprost compared with pilocarpine as third-line therapy in exfoliation glaucoma

Excluded drug

• "Konstas, A. G., Maltezos, A. C., Gandi, S., Hudgins, A. C., and Stewart, W. C. Comparison of 24-hour intraocular pressure reduction with two dosing regimens of latanoprost and timolol maleate in patients with primary open-angle glaucoma

Stewart 2010


It is not a RCT and has less than 100 patients


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Other (specify):Study design does not match KQ


It is not a RCT and has less than 100 patients


Non-FDA-approved drug combination

• "Konstas, A. G., Mikropoulos, D., Kaltzos, K., Jenkins, J. N., and Stewart, W. C. 24-hour intraocular pressure control obtained with evening- versus morning-dosed travoprost in primary open-angle glaucoma

Unique comparators

• "Konstas, A. G., Mylopoulos, N., Karabatsas, C. H., Kozobolis, V. P., Diafas, S., Papapanos, P., Georgiadis, N., and Stewart, W. C. Diurnal intraocular pressure reduction with latanoprost 0.005% compared to timolol maleate 0.5% as monotherapy in subjects with exfoliation glaucoma

Stewart 2010


Non-FDA-approved drug combination

• "Konstas, A. G., Papapanos, P., Tersis, I., Houlia, D., and Stewart, W. C. Twenty-four-hour diurnal curve comparison of commercially available latanoprost 0.005% versus the timolol and dorzolamide fixed combination

Stewart 2010


Other (specify):not FDA approved"


It is not a RCT and has less than 100 patients

• "Konstas, A. G., Topouzis, F., Tersis, I., Holmes, K. T., and Stagos, N. T. Brimonidine 0.2% given two or three times daily versus timolol maleate 0.5% in primary open-angle glaucoma

Medical KQ 3 only

D-90

Meeting abstract


Other (specify): Not a comparison of interest


No original data (e.g., systematic review, narrative review, editorial, letter)


No subjects with open-angle glaucoma


It is combined cataract/glaucoma surgery study published before April 2000


It is combined cataract/glaucoma surgery study published before April 2000


Other (specify): I can't tell what types of glaucoma the subjects had


Meeting abstract

"Kotecha, A., White, E., Schlottmann, P. G., and Garway-Health, D. F. Intraocular pressure measurement precision with the Goldmann applanation, dynamic contour, and ocular response analyzer tonometers

Systematic review

"Kothe, A. C., Ripp, K. M., Sharma, V., Von Tress, M. S., DeSantis, L., Bergamini, M. V. W., and Robertson, S. M. IOP-Lowering Efficacy and Safety of Travoprost DID vs. Concomitantly Dosed Travoprost and Brimonidine BID vs. Placebo BID in Patients with Open-Angle Glaucoma or Ocular Hypertension

Meeting abstract


It is not a RCT and has less than 100 patients


No original data (e.g., systematic review, narrative review, editorial, letter)

"Kovacic, Z., Ivanisevic, M., Stanic, R., Bojic, L., Capkun, V., and Rogosica, V. [Additive therapy with carboanhydrase inhibitors for open angle glaucoma previously treated with timolol 0.5% drops]

Foreign language


Medical KQ 3 or KQ 3 and KQ 6 only

"Kozobolis, V. P., Christodoulakis, E. V., Tzanakis, N., Zacharopoulos, I., and Pallikaris, I. G. Primary deep sclerectomy versus primary deep sclerectomy with the use of mitomycin C in primary open-angle glaucoma

Cheng 2009

"Kozobolis, V. P., Konstas, A. G. P., Makridaki, I., Efremova, R., and Stewart, W. C. 24-Hour Intraocular Pressure Evaluation of the Dorzolamide/Timolol Maleate Fixed Combination versus Latanoprost

Meeting abstract

"Kozuchowska, I. and Wolska-Borowska, E. [Evaluation of the results of treatment of glaucoma with timolol]

Foreign language
  It is not a RCT and has less than 100 patients

  Foreign language

• "Krasnov, M. M., Kraus, G., Akopian, V. S., Kazakova, E. L., and Ruzhichkova, E. [Effectiveness of laser trabeculoplasty in primary open-angle and pseudoxefilative glaucoma]
  Foreign language

• "Krause, K., Kuchle, H. J., and Baumgart, M. [Comparative studies of pilocarpine gel and pilocarpine eyedrops]
  Foreign language

  No original data (e.g., systematic review, narrative review, editorial, letter)

  It is not a RCT and has less than 100 patients

  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Krieglstein, G. K. and Fleig, H. [Nadolol/Timolol: A comparison of two different beta blockers in cronic glaucoma]
  Foreign language

• "Krieglstein, G. K., Novack, G. D., Voepel, E., Schwarzbach, G., Lange, U., Schunck, K. P., Lue, J. C., and Glaivos, E. P. Levobunolol and metipranolol: comparative ocular hypotensive efficacy, safety, and comfort
  Unique comparators

  It is a case series

• "Krist, P., Fric, E., Al Marei, S., and Zapletalova, J. [Deep perforating trabeculectomy--results up to six years follow-up]
  Foreign language

  It is a case series

• "Krivitskii, A. K. and Kozina, L. V. [The late results of the surgical treatment of glaucoma in patients with atherosclerosis and diabetes mellitus]
  Foreign language

  It is a case series

  Does not address any key questions

  It is a case series

• "Krupin Jr., J., Chiavelli, M., Borawski, G., Devaney, M., Epstein, D., Berson, F., Latina, M., Melamed, S., Berry, I., Evans, C., Johnson, E., Joyner, M., Kityay, R., Lindenmeyer, A., Mcgee, R., Piva-Bowe, D., Smith, T. J., Stout, K., and Way, R. The Glaucoma Laser Trial (GLT) and glaucoma laser trial follow-up study: 7. Results
  Duplicate "

• "Kruger, A., Hille, K., Kohlhof, K., Spang, S., and Ruprecht, K. W. [Laser-Flare in combined cataract and glaucoma surgery with and without intra-operative mitomycine application]
  Meeting abstract

• "Krupin T, Liebmann JM, Greenfield DS, Ritch R, Gardiner S, and Low-Pressure Glaucoma Study Group. A randomized trial of brimonidine versus timolol in preserving visual function: results from the Low-Pressure Glaucoma Treatment Study
  Duplicate of 80144 

• "Krupin, T. A clinical trial studying neuroprotection in low-pressure glaucoma
  Medical KQ 3 or KQ 3 and KQ 6 only

• "Krupin, T., Liebmann, J. M., Greenfield, D. S., Rosenberg, L. F., Ritch, R., and Yang, J. W. The Low-pressure Glaucoma Treatment Study (LoGTS) study design and baseline characteristics of enrolled patients Baseline LoGTS: use for review update"


Other (specify): no harms"


It is not a RCT and has less than 100 patients

• "Kruse, W. Metipranolol: A new beta-blocker: METIPRANOLOL - EIN NEUER BETAREZEPTORENBLOCKER Duplicate"


Data not abstractable

• "Kubota, M., Harada, T., Kubota, S., Hashimoto, T., and Tsuru, T. Ocular hypotensive effect of brinzolamide after switching from dorzolamide Foreign language"


It is a case series

• "Kumar, H., Sudan, R., Sethi, H. S., and Sony, P. Timolol maleate 0.5% versus timolol maleate in gel forming solution 0.5% (Timolol GFS) in open angle glaucoma in India. Preliminary safety and efficacy study. Indian J Ophthalmol  2002 ;50 (1): 21-3.

It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients

• "Kumar, S., Pannu, B. K. S., Sawhney, R., Jain, R., and Sood, S. Comparative efficacy of gel-forming and ophthalmic solutions of 0.5% timolol in open-angle glaucoma Medical KQ 3 or KQ 3 and KQ 6 only


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients

• "Kurtz, S. and Shemesh, G. The efficacy and safety of once-daily versus once-weekly latanoprost treatment for increased intraocular pressure Unique comparators


It is a case series

MITOMYCIN C APPLICATION BEFORE VERSUS AFTER TRABECULECTOMY FLAP DISSECTION

Meeting abstract

Meeting abstract
- "Kuwayama, Y., Komemushi, S., and Tafluprost Multi-center Study Group. [Intraocular pressure lowering effect of 0.0015% tafluprost as compared to placebo in patients with normal tension glaucoma: randomized, double-blind, multicenter, phase III study]

Foreign language
- "Laake, K. [Systemic adverse affects of beta-blocking agents used in local treatment of the eye]

Foreign language
- "Labbe, A. and Baudouin, C. [Treatment of glaucoma in patients with dry eye syndrome]

Foreign language
- "Lachkar, Y. Non penetrating deep sclerectomy with external trabeculectomy (NPT) vs trabeculectomy: prospective study

Meeting abstract

It is not a RCT and has less than 100 patients

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Other (specify):Study design does not match KQ

Other (specify):Study design does not match KQ
- "Lai, J. S. M. and Ho, P. C. P. TRABECULECTOMY COMBINED WITH BETA IRRADIATION IN UNCOMPLICATED PRIMARY OPEN ANGLE GLAUCOMA

Meeting abstract

No original data (e.g., systematic review, narrative review, editorial, letter)

Meeting abstract

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

Other (specify):pilocarpine
"Laibovitz, R., Zimmerman, K., Getson, A., Shedden, A., Laurence, J., and Adamsons, I. COMPARISON OF THE EFFICACY AND TOLERABILITY OF PRESERVATIVE-FREE 2.0% DORZOLAMIDE/0.5% TIMOLOL (PF DORZ/TIM) AND 2.0% DORZOLAMIDE/0.5% TIMOLOL (DORZ/TIM)

Meeting abstract


OAG can't be analyzed separately


Data not abstractable


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Lamping, K. A and Belkin, J. 5-Fluorouracil (5-FU) and Mitomycin-C in Pseudophakic Patients

Meeting abstract

"Lamping, K. A and Belkin, J. 5-Fluorouracil (5-FU) and Mitomycin-C in pseudophakic patients. Ophthalmology 95;102 (1): 70-5.

Data not abstractable


Does not address any key questions


Other (specify):comparison of 2 case series


It is not a RCT and has less than 100 patients

"Langham, M. E., Carenini, B. B., Brogniatti, A., Corenini, A. B., and Sibour, G. DIFFERENCES IN THE ACTIONS OF TIMOLOL AND BETAXOLOL ON VISION AND OCULAR PULSATILE BLOOD FLOW IN GLAUCOMA

Meeting abstract

"Lankaranian, D., Patel, R., Moster, M. R., Wizov, S., Alvim, H. S., Lopes, J. F., Tong, M., and Spaeth, G. L. A Randomized Prospective Clinical Trial of the Efficacy of Cyclosporine Ophthalmic Emulsion 0.05% Following Trabeculectomy With Antimetabolite

Meeting abstract


It is a case series


Meeting abstract

"Larsson, L. I. Effect on intraocular pressure during 24 hours after repeated administration of the fixed combination of latanoprost 0.005% and timolol 0.5% in patients with ocular hypertension. J Glaucoma 2001;10 (2): 109-14.

Other (specify):fixed combination

"Larsson, L. I. The effect on diurnal intraocular pressure of the fixed combination of latanoprost 0.005% and timolol 0.5% in patients with ocular hypertension. Acta Ophthalmol Scand 2001;79 (2): 125-8.

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Larsson, L. I., Diestelhorst, M., and European-Canadian Latanoprost Fixed Combination Study Group. A 12-Week, Randomized, Double-Masked Multicenter Study of the Fixed Combination Latanoprost and Timolol in the Evening vs. the Individual Components

Meeting abstract

"Lass, J. H, Simpson, C. V, and Eriksson, G. A Double-Masked, Randomized 1-Year Study Comparing the Corneal Effects of Latanoprost and Timolol

Meeting abstract

Does not address any key questions

Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Lass, J. H., Khosrof, S., Laurence, J. K., Ghosh, K., Adamson, I., and The Dorzolamide Study Group. CORNEAL SAFETY OF DORZOLAMIDE, TIMOLOL, AND BETAXOLOL AFTER 1 YEAR OF THERAPY Meeting abstract

Does not address any key questions
• "Lau, G., Young, S., and Lehrer, R. EFFICACY OF TRABECULECTOMY WITH AND WITHOUT THE EX-PRESS SHUNT Duplicate 
• "Lauande, R., Costa, V. P, Rocha, V. A, Vidal, R., Ribeiro, M. P, Antunes, A., and Velanes, A. Travoprost 0,004% and Timolol Maleate 0.5% in Alternate Days Compared to Standard Monotherapy: Study of Intraocular Pressure-efficiency of a New Therapy Modality Meeting abstract

It is not a RCT and has less than 100 patients
• "Laube, T., Ritters, B., Selbach, M., and Hudde, T. Clinical Experiences and Results of Application of Mitomycin C in Trabeculectomy: Klinische Erfahrungen und Ergebnisse beim Einsatz von Mitomycin C bei der Trabekulektomie

Duplicate 


No subjects with open-angle glaucoma
• "Lavado Landeo, Lincoln and Paredes Portilla, M nica. TrabeculoplastÆa con lbser diodo Foreign language

No original data (e.g., systematic review, narrative review, editorial, letter)

It is a case series

It is a case series

It is a case series

OAG can’t be analyzed separately

It is not a RCT and has less than 100 patients

Does not address any key questions


It is not a RCT and has less than 100 patients


It is a case series


Data not abstractable


No subjects with open-angle glaucoma

• "Le Rebeller, M. J. [Our experience with timolol] .

Foreign language


Other (specify):No control


• Other (specify):No control

• "Lee, D. A. and Gornbein, J. A. Effectiveness and safety of brimonidine as adjunctive therapy for patients with elevated intraocular pressure in a large, open-label community trial

Unique comparators

• "Lee, D. A. Efficacy of brimonidine as replacement therapy in patients with open-angle glaucoma or ocular hypertension

Unique comparators


OAG can’t be analyzed separately


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Lee, D. and Alphagan Glaucoma Trial Study Group. THE EFFICACY AND SAFETY OF ALPHAGAN® (Brimonidine) FOR SUBJECTS WITH PRIMARY OPEN-ANGLE HYPERTENSION OR OCULAR HYPERTENSION

Meeting abstract


Meeting abstract


OAG can’t be analyzed separately

• No subjects with open-angle glaucoma


• It is a case series


• Other (specify): study design does not match KQ (KQ2)


Systematic review


• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


• It is a case series

Meeting abstract

• "Leibovici, M. [Iatrogenic pathogenesis of anti-glaucoma medical therapy]
Foreign language

• "LehmMaraini, G., Gandolfi, S. A., Rossetti, L., Cimino, L., and Orzalesi, N. SUBSTITUTION WITH LATANOPROST COMPARED WITH ADDITION OF LATANOPROST TO MAXIMALLY TOLERATED MEDICAL THERAPY IN UNCONTROLLED HUMAN GLAUCOMA: PROSPECTIVE, RANDOMIZED, 3 MONTH-CLINICAL TRIAL
Meeting abstract


• It is combined cataract/glaucoma surgery study published before April 2000

Meeting abstract

Meeting abstract


It is combined cataract/glaucoma surgery study published before April 2000


No original data (e.g., systematic review, narrative review, editorial, letter)

• "Leroy, C. and Collignon-Brach, J. [Primary open-angle glaucoma. Effects of an eyedrop combining timolol and pilocarpine on the ocular pressure]
Foreign language

• "Leske, M. R., Koulis, T., Sampalis, F., Sampalis, J. S., and Bastien, N. R. Effectiveness and safety of dorzolamide-timolol alone or combined with latanoprost in open-angle glaucoma or ocular hypertension
Unique comparators

• "Leske, M. C., Heijl, A., Hussein, M., Bengtsson, B., Hyman, L., and Komaroff, E. Factors for glaucoma progression and the effect of treatment: the early manifest glaucoma trial
EMGT"

Does not address any key questions

- No original data (e.g., systematic review, narrative review, editorial, letter)

OAG can’t be analyzed separately

- "Leuenberger, P. M. [Trabeculectomy and trabeculotomy (author's transl)] Foreign language"
- It is not a RCT and has less than 100 patients

It is not a RCT and has less than 100 patients

- "Levin, M. L. Phacoemulsification, foldable IOL, Holmium laser sclerostomy, and 5-FU. Ophthalmic Surg 92 ;23 (8): 566

No original data (e.g., systematic review, narrative review, editorial, letter)

- "Levobunolol. A beta-adrenoceptor antagonist effective in the long-term treatment of glaucoma. The Levobunolol Study Group (Appended)
- Medical KQ 3 or KQ 3 and KQ 6 only Medical KQ 3 or KQ 3 and KQ 6 only
- "Levobunolol. A four-year study of efficacy and safety in glaucoma treatment. The Levobunolol Study Group. Medical KQ 3 or KQ 3 and KQ 6 only Medical KQ 3 or KQ 3 and KQ 6 only
- "Levy, N. S. and Alsbury, C. TIMOLOL-IN-GELRITE ONCE DAILY IN GLAUCOMA. Meeting abstract"

Other (specify): Not a medication available here"

- "Lewis, R. A. Comparative Safety and Ocular Hypotensive Efficacy of Brimonidine Tartrate 0.2% and Timolol Maleate 0.5% in Patients with Glaucoma or Ocular Hypertension: 12-month Results from an Ongoing Study. Meeting abstract"

Other (specify): Not FDA approved, Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Other (specify): Study design does not match KQ


Other (specify): Harms not analyzed separately for the two interventions"


Other (specify): Study design does not match KQ


- "Leydhecker, W. and Krieglstein, G. K. [The effect of low concentrations of pilocarpine with phenylephrine on intraocular pressure in glaucoma]

Foreign language

- "Leydhecker, W. and Krieglstein, G. K. The effect of low concentrations of pilocarpine with phenylephrine on intraocular pressure in glaucoma: DIE WIRKUNG SCHWACHER KONZENTRATIONEN VON PILOKARPIN MIT PHENYLEPHRIN AUF DEN INTRAOKULAREN DRUCK BEI GLAUKOM. EINE DOPPELBLIND-CROSS-OVER STUDIE Duplicate"


- OAG can’t be analyzed separately

- "Li, W. J., Ding, Y. L., Zhu, F., and Li, H. [Comparison of two different conjunctival incisions of combined trabeculectomy]

Foreign language

- "Lichter, P. R., Janz, N. K., Musch, D. C., Gillespie, B., Guire, K. E., Wren, P. A., and Mills, R. P. The collaborative initial glaucoma treatment study (cigts) interim outcomes report with up to 5 years of follow-up Meeting abstract

- "Lichter, P. R., Musch, D. C., Gillespie, B. W., Guire, K. E., Janz, N. K., Wren, P. A., and Mills, R. P. Interim clinical outcomes in the Collaborative Initial Glaucoma Treatment Study comparing initial treatment randomized to medications or surgery CIGTS—part of 639 now"

- "Lichter, P. R., Musch, D. C., Gillespie, B. W., Nizioł, L. N., and the CIGTS Study Group. Trabeculectomy as Initial Treatment for OAG Patients with Substantial VF Defects Meeting abstract

- "Lichter, P. R., Musch, D. C., Gillespie, B., Nizioł, L. M., and CIGTS Study Group. Initial Surgery Favorable for Patients With Advanced Visual Field Loss in the Collaborative Initial Glaucoma Treatment Study (CIGTS) Meeting abstract


- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

- "Lichter, P. R., Newman, L. P., Wheeler, N. C., and Beall, O. V. Patient tolerance to carbonic anhydrase inhibitors

Unique comparators


Other (specify): Study design does not match KQ (KQ3)

- "Lienert, F. and Busse, H. [One year's experience with pilocarpin-ocusert in the therapy of glaucoma (author's transl)]. Klin Monbl Augenheilkd 75;167(6):870-1.

Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Lima, F. E., Magacho, L., Guimaraes, N., Avila, M., and Susanna, R. A. Prospective, Randomized, Comparative Study between Endoscopic Cyclophotocoagulation and the Ahmed Drainage Implant in Refractory Glaucoma
  Meeting abstract
  Does not address any key questions
• "Lima, Vera Christina Waller de, Mello, Paulo Augusto de Arruda, and Prata Junior, JoPo Antonio. Ciclofotocoagulação com laser diodo em glaucoma refratário, resultado a longo prazo
  Foreign language
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Does not address any key questions
  It is not a RCT and has less than 100 patients
  It is a case series
• "Linden, C. and Alm, A. Latanoprost and physostigmine have mostly additive ocular hypotensive effects in human eyes. Arch Ophthalmol 97 ;115 (7): 857-61.
  No subjects with open-angle glaucoma
  No subjects with open-angle glaucoma
  Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  Medical KQ 3 or KQ 3 and KQ 6 only
• "Lippa, E. A., Clineschmidt, C. M., Tipping, R. W., and Strohmaier, K. M. DORZOLAMIDE HYdrochloride: SIX-WEEK, DOSE-RESPONSE STUDY OF AN ACTIVE TOPICAL CARBONIC ANHYDRASE INHIBITOR
  Meeting abstract
• "Lippa, E., Sherwood, M., Laibovitz, R., Miller, E., McMahon, C., Clineschmidt, C., and Caprioli, J. MK-417 VS. TIMOLOL: COMPARATIVE ACTIVITY
  Meeting abstract
• "Littmann, L., Kempler, P., Rohla, M., and Fenyvesi, T. [Severe atrioventricular block caused by pilocarpine eyedrops]
  Foreign language
  Meeting abstract
• "Liu, C. J., Chou, J. C K., Hsu, W.-M., and Liu, J.-H. Effects of latanoprost 50 (mu)g/ml on Chinese patients with primary open-angle glaucoma and ocular hypertension
  Foreign language

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Liu, H. N., Chen, X. L., Li, X., Nie, Q. Z., and Zhu, Y. Efficacy and tolerability of one-site versus two-site phaco trabeculectomy: a meta-analysis of randomized controlled clinical trials

Systematic review


It is a case series

"Liu, J. H., Medeiros, F. A., Slight, J. R., and Weinreb, R. N. Comparing diurnal and nocturnal effects of brinzolamide and timolol on intraocular pressure in patients receiving latanoprost monotherapy

Unique comparators

"Liu, Y. and Birt, C. M. Argon Versus Selective Laser Trabeculoplasty in Younger Patients: 2-year Results. J Glaucoma 2011; OAG can't be analyzed separately

"Liu, Y., Sponsel, W. E, and Paris, G. R. Nonpenetrating deep sclerectomy (npds) with mmc versus trabeculectomy with mmc: comparison of efficacy and perioperative complications

Meeting abstract


Data not abstractable

"Lobstein, A. and Flament, J. [Residual effect of timoptol in ocular hypertension]

Foreign language


Other (specify):Study design does not match KQ


Foreign language


It is a case series


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Other (specify):Not inc drug

"Loftfield, K. and Ball, S. F. S-FLUOROURACIL (5-FU) IN PRIMARY TRABECULECTOMY: A RANDOMIZED TRIAL

Meeting abstract


Unique comparators

"Long, D., Zimmerman, T., Spaeth, G., Novack, G., Burke, P. J., and Duzman, E. Minimum concentration of levobunolol required to control intraocular pressure in patients with primary open-angle glaucoma or ocular hypertension

Medical KQ 3 or KQ 3 and KQ 6 only


Other (specify):Not a comparison of interest


Other (specify):Study design does not match KQ

"Low, M., Buhler, C., and Mester, U. [Comparison of Healon, Healon GV, and Healon 5 in viscotrabeculectomy]. Ophthalmologe 2003;100 (7): 539-44.
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

- "Lieif, Y., Berete-Coulibaly, R., Labbe, A., Bouassida, W., and Lachkar, Y. [Mid-term effects of two-site phacotrabeculectomy with limbal-based conjunctival flap and microincision trabeculectomy with adjustable sutures]
- OAG can’t be analyzed separately
- It is a case series
- "Luchik, V. I. [Efficacy of combined conservative treatment of patients with initial open-angle glaucoma]
- Foreign language
- "Luchik, V. I. [The dynamic glaucomatous process based on the data from the long-term dispensary observations of patients operated on in the initial stage of the disease]
- Foreign language
- Meeting abstract
- Cheng 2009 and Chai 2010
- It is a case series

It is not a RCT and has less than 100 patients

- No original data (e.g., systematic review, narrative review, editorial, letter)
- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
- It is not a RCT and has less than 100 patients
- Foreign language
- "Lupinacci, A. P., Netland, P. A., Fung, K. H., Evans, D., and Zhao, Y. Comparison of twice-daily and three-times-daily dosing of dorzolamide in ocular hypertension and primary open-angle glaucoma patients treated with latanoprost
- Unique comparators
- It is not a RCT and has less than 100 patients
- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
- It is a case series
- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Lutfalla, A. I. [Clinical results of a 1-stage cataract extraction with trabeculectomy]

Foreign language

• "Luu, K. T., Raber, S. R., Nickens, D. J., and Vicini, P. A model-based meta-analysis of the effect of latanoprost chronotherapy on the circadian intraocular pressure of patients with glaucoma or ocular hypertension

Systematic review


It is a case series


Data not abstractable

• "Ma, H., Shao, H., Lee, P. Y., Comer, G., and Ma, A. A COMPARISON OF IOP-REDUCING EFFECT OF LATANOPROST AND TIMOLOL IN OCULAR HYPERTENSION AND PRIMARY OPEN-ANGLE GLAUCOMA

Meeting abstract

• "Ma, J.-X. Treating patients with primary open angle glaucoma or ocular hypertension with domestic and imported latanoprost drop: Comparison on efficacy and cost

Foreign language


It is a RCT and has less than 100 patients


No original data (e.g., systematic review, narrative review, editorial, letter)

• "Macky TA. Bimatoprost versus travoprost in an Egyptian population: a hospital-based prospective, randomized study

Duplicate of 80213"


Other (specify):Mean age less than 50"

• "Macky, T. A. Bimatoprost versus travoprost in an Egyptian population: a hospital-based prospective, randomized study

Only addresses med KQ 3 and 6"

• "Madelain, J., Isorni, M. C., Malthieu, D., and Turut, P.


Data not abstractable


It is not a RCT and has less than 100 patients

• "Maffrand, Roque Alejandro. Cirugia del glaucoma: trabeculo-irido-encleisis intraescleral

Foreign language


It is a case series

• "Magacho, L., Queiroz, C. F., Medeiros, M., Lima, F. E., Magacho, B., and Avila, M. Improvement in glaucomatous visual field thresholds after reduction of intraocular pressure: Clinical vs. surgical treatment: Melhora dos limiares de sensibilidade do campo visual após redução da pressão intra-ocular em pacientes com glaucoma: Tratamento cirúrgico vs. clínico

Foreign language


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• "Magacho, Leopoldo, Costa, Marcelus Layguel, Lima, Francisco Eduardo, Magacho, Bernardo, and -vila, Marcos Pereira de. Anblogos das prostaglandinas diminuem a sensibilidade do teste provocativo da ibopamina no glaucoma

Foreign language

• "Magacho, Leopoldo, Queiroz, Carlos Frederico, Medeiros, Mariele, Lima, Francisco Eduardo, Magacho, Bernardo, and Avila, Marcos. Melhora dos limiares de sensibilidade do campo visual ap€s reducPo da
pressPo intra-ocular em pacientes com glaucoma: tratamento cir·rgico vs. cl/Enico

**Foreign language**

- "Magder, H. and Boyaner, D. The use of a longer acting pilocarpine in the management of chronic simple glaucoma

  **Duplicate**


  **It is not a RCT and has less than 100 patients**


  **It is not a RCT and has less than 100 patients**


  **No original data (e.g., systematic review, narrative review, editorial, letter)**

- "Maichuk, I. u. F. and Erichev, V. P. [Pharmaceutical and clinical evaluation of soluble pilocarpine eye films]

  **Foreign language**

- "Makabe, R. [Mydriasis tonography during treatment with miotics]

  **Foreign language**


  **It is a case series**


  **Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

- "Malta, Roberto Freire Santiago. Reprodutibilidade do Teste de pronopo·siga·o em quarto escuro

  **Foreign language**


  **It is combined cataract/glaucoma surgery study published before April 2000**

- "Mamedov, N. G., Shitler, A. L., and Frolov, A. V. [Comparative studies of the efficacy of laser therapy of common and pseudoexfoliative primary open-angle glaucoma]

  **Foreign language**


  **It is not a RCT and has less than 100 patients**

- "Mandia Junior, Carmo, Kasahara, Niro, Seixas, Francisco Soares, Paolera, Maur;Ecio Della, Almeida, Geraldo Vicente de, and Cohen, Ralph. ComparagPo a longo prazo entre a facetomia extracapsular combinada a trabeculectomia e a facotrabeculectomia

  **Foreign language**

- "Mandic, Z. and Ivekovic, R. Glaucoma triple procedure: comparison of ECCE and phacoemulsification combined with trabeculectomy

  **Meeting abstract**


  **Other (specify):Study design does not match KQ**


  **Excluded drug**


  **It is not a RCT and has less than 100 patients**

- "Mani, K. M. Experiencia con la trabeculectomia en la poblacion de Jamaica

  **Foreign language**
• "Manni, G. and Bucci, M. Substitution with Latanoprost monotherapy or additional with Dorzolamide in Timolol treated patients. A randomized, multicenter study in Italy
Meeting abstract
Does not address any key questions
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Manni, G., Centofanti, M., Parravano, M., Oddone, F., and Bucci, M. G. A 6-month randomized clinical trial of bimatoprost 0.03% versus the association of timolol 0.5% and latanoprost 0.005% in glaucomatous patients Non-FDA-approved drug combination
Animal or in vitro data
• "Manni, G., Denis, P., Chew, P., Sharpe, E. D., Orento-Nania, S., Coote, M. A., Laganovska, G., Volkson, L., Zeyen, T., Filatori, I., James, J., and Aung, T. The safety and efficacy of brinzolamide 1%/timolol 0.5% fixed combination versus dorzolamide 2%/timolol 0.5% in patients with open-angle glaucoma or ocular hypertension. J Glaucoma 2009;18 (4): 293-300
Other (specify): Brin/Tim not fda-approved
• "Manni, G., Denis, P., Zeyen, T., Aung, T., Filatori, I., James, J., Salem, C., and Smoot, T. Comparison of Safety and Efficacy of Brinzolamide/Timolol (AZARGATM) vs. COSOPT® in Patients With Open-Angle Glaucoma or Ocular Hypertension KQ 3 only *
• "Manni, G., Migliardi, R., Lorenzano, D., Minchioti, S., and Bucci, M. G. Comparison between Surgical and Medical Treatment Effect on Diurnal Intraocular Pressure Fluctuations in Open Angle Glaucoma Patients
Meeting abstract
No original data (e.g., systematic review, narrative review, editorial, letter)
• "Mansouri K, Tran HV, Ravinet E, and Mermod A. Comparing deep sclerectomy with collagen implant to the new method of very deep sclerectomy with collagen implant: a single-masked randomized controlled trial. Journal of glaucoma 2010;
OAG can’t be analyzed separately
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
OAG can’t be analyzed separately
Other (specify): Not a comparison of interest
OAG can’t be analyzed separately
**CIEGO DE LA DIPIVALYL EPINEFRINA Y EL BITARTRATO DE EPINEFRINA. ARCH. SOC. ESP. OFTALMOL. 84 ;47 (1): 1-5 .

**Does not include treatment for open-angle glaucoma (medical, surgical or combined)**

- "Maraini, G., Vinciguerra, E., and Barberini, E. [Personal experience with pilocarpine-Ocusert in the treatment of glaucoma]

**Foreign language**


**Does not address any key questions (see below for questions), Data not abstractable**


**Meeting abstract**

- "March, W. F. and Ochsner, K. I. The long-term safety and efficacy of brinzolamide 1.0% (Azopt) in patients with primary open-angle glaucoma or ocular hypertension

**Medical KQ 3 or KQ 3 and KQ 6 only**

- "March, W. F. and Ochsner, K. I. The long-term safety and efficacy of brinzolamide 1.0% (azopt) in patients with primary open-angle glaucoma or ocular hypertension. The Brinzolamide Long-Term Therapy Study Group

**Medical KQ 3 or KQ 3 and KQ 6 only**

- "March, W. F., Kothe, A. C., and The Brinzolamide Long-Term Therapy Study Group. EFFECT OF LONG-TERM THERAPY WITH BID OR TID-DOSED BRINZOLAMIDE 1% (AZOPTTM) COMPARED TO TIMOLOL 0.5% ON THE IOP, CORNEAL HEALTH AND VISUAL FIELDS OF PATIENTS WITH POAG OR OHT

**Meeting abstract**

- "March, W. F., Silver, L. H., and The Brinzolamide Long-Term Therapy Study Group. THE LONG-TERM SAFETY AND EFFICACY OF BRINZOLAMIDE (AZOPT), A NEW TOPICAL CARBONIC ANHYDRASE INHIBITOR, IN PATIENTS WITH OPEN-ANGLE GLAUCOMA AND OCULAR HYPERTENSION

**Meeting abstract**


**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

- "Marcon, Italo Mundialino, Mello, Paulo Augusto de Arruda, CorrWa, Zgla Maria da Silva, and Marcon, Alexandre Seminoti. Correlagåo entre os achados b biomicroscopia ultra-sónica de bolhas filtrantes, com ou sem mitomicina C, e a pressåo intra-ocular

**Foreign language**

- "Marcus, C., Moster, M., and Wilson, R. A FOUR YEAR FOLLOW UP COMPARISON OF 180° VS. 360° NEODYMIMIUM:YAG TRANSSCLERAL CYCLOPHOTOCOAGULATION

**Meeting abstract**


**It is not a RCT and has less than 100 patients**


**Foreign language**

- "Marigo, F. A., Cronemberger, S., and Calixto, N. LONG-TERM USE OF TOPICAL ANTIGLAUCOMATOUS DRUGS AND SUCCESS OF TRABECULECTOMY

**Meeting abstract**


**Foreign language**


**OAG can’t be analyzed separately**


**No original data (e.g., systematic review, narrative review, editorial, letter)**

Animal or in vitro data

OAG can't be analyzed separately
• "Marquard, R. and Schubert, T. [Modification of tear film break-up time by beta blocker eyedrops without preservatives]

Foreign language
• "Martenet, A. C. and Gruber, P. [Trabeculectomy. Role of its localization]

Foreign language
• "Martin, E., Martinez-de-la-Casa, J. M., Garcia-Feijoo, J., Troyano, J., Larrosa, J. M., and Garcia-Sanchez, J. A 6-month assessment of bimatoprost 0.03% vs timolol maleate 0.5%: hypotensive efficacy, macular thickness and flare in ocular-hypertensive and glaucoma patients

Medical KQ 3 or KQ 3 and KQ 6 only

Data not abstractable

Does not address any key questions

It is a case series

It is not a RCT and has less than 100 patients
• "Martinez, A. and Sanchez, M. A comparison of the effects of 0.005% latanoprost and fixed combination dorzolamide/timolol on retrobulbar haemodynamics in previously untreated glaucoma patients

Medical KQ 3 only

Other (specify): non FDA approved drug
• "Martinez, A. and Sanchez, M. Bimatoprost/timolol fixed combination vs latanoprost/timolol fixed combination in open-angle glaucoma patients. Eye (Lond) 2009;23 (4): 810-8.

Does not address any key questions
• "Martinez, A. and Sanchez, M. Effects of dorzolamide 2% added to timolol maleate 0.5% on intraocular pressure, retrobulbar blood flow, and the progression of visual field damage in patients with primary open-angle glaucoma: a single-center, 4-year, open-label study. Clin Ther 2008;30 (6): 1120-34.

Other (specify): study design does not match KQ (KQ3)

It is a case series

Other (specify): not FDA approved combination
• "Martinez, A. and Sanchez-Salorio, M. A comparison of the long-term effects of dorzolamide 2% and brinzolamide 1%, each added to timolol 0.5%, on retrobulbar hemodynamics and intraocular pressure in open-angle glaucoma patients

Medical KQ 3 only
• "Martinez, A. and Sanchez-Salorio, M. Predictors for visual field progression and the effects of treatment with dorzolamide 2% or brinzolamide 1% each added to timolol 0.5% in primary open-angle glaucoma

Unique comparators

Data not abstractable
• "Martinez-de-la-Casa, J. M., Castillo, A., Garcia-Feijoo, J., Mendez-Hernandez, C., Fernandez-Vidal, A., and Garcia-Sanchez, J. Concomitant administration of travoprost and brinzolamide versus fixed
latanoprost/timolol combined therapy: three-month comparison of efficacy and safety

Non-FDA-approved drug combination


- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

- Martini, E., Laffi, G. L., Sprovieri, C., and Scorolli, L. Low-dosage mitomycin C as an adjunct to trabeculectomy. A prospective controlled study

Included in Wilkins 2010


- It is not a RCT and has less than 100 patients

- Maruyama, K. and Shirato, S. Additive effect of dorzolamide or carteolol to latanoprost in primary open-angle glaucoma: a prospective randomized crossover trial

Unique comparators


- It is a case series

- Masieri, L. T., Parmeggiani, F., Gasparini, E., Gavelli, I., Peruz, G., Graziani, F., and Costagliola, C. Effects of topical administration of clonidine 0.125% and brimonidine 0.2% on ocular perfusion pressure and visual field parameters in patients with primary open-angle glaucoma: Effetti della somministrazione topica di clonidina 0.125% e brimonidina 0.2% sulla pressione di perfusione oculare e sugli indici perimetrici in pazienti affetti da glaucoma primario ad angolo aperto

Foreign language

- Masenda, K. Eye and prostaglandins. Clinical application of prostaglandin synthetase inhibitor

Foreign language

- Mattox, C., Chung, P., and Schuman, J. COMPARISON OF 5.5 MM VERSUS 3.5 MM SCLERAL FLAPS IN COMBINED PHACOEMULSIFICATION AND TRABECULECTOMY WITH MITOMYCIN C

Meeting abstract

- Maul de la Puente, Eugenio and Vega Sabaleta, Rebeca. Efecto de la pilocarpina gel al 4 sobre la presion intraocular en glaucoma crônico simple

Foreign language

- Maul, E., Carrasco, F. G., Costa, V. P., Casiraghi, J. F., Vargas, E. M. G., Sarmina, J. S., and Maylo, R. A Six-Week Double-Masked Study Comparing Travoprost 0.004% to Latanoprost 0.005% Followed by a Six-Week Open-Label Treatment on Travoprost 0.004%
• Meeting abstract
• "Maul, E., Carrasco, F. G., Costa, V. P., Casiraghi, J. F., Vargas, E., Sarmina, J. S., and Mayol, R. A 6-week, multicenter, randomized, double-masked, parallel-group study comparing travoprost 0.004% to latanoprost 0.005% followed by 6-week, open-label treatment with travoprost 0.004%

• Medical KQ 3 or KQ 3 and KQ 6 only
It is not a RCT and has less than 100 patients
Data not abstractable
No subjects with open-angle glaucoma
It is combined cataract/glaucoma surgery study published before April 2000
Does not address any key questions
• "McCarty, G., Stewart, W. C., Quayle, W., Levin, J., and Rienhart, M. EVALUATION OF MORNING IOP CONTROL BY BEDTIME PILOCARPINE GEL DOSING

• Meeting abstract
Data not abstractable
No original data (e.g., systematic review, narrative review, editorial, letter)
Other (specify): Study design does not match KQ
Other (specify): Mixed glaucoma
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "McNeal, E. and Yablonski, M. E. A Paired Comparison of Travoprost and Latanoprost on IOP and Conjunctival Hyperemia
Meeting abstract
No original data (e.g., systematic review, narrative review, editorial, letter)
• "Medeiros, F. A., Alencar, L. M., Zangwill, L. M., Sample, P. A., and Weinreb, R. N. The Relationship between intraocular pressure and progressive retinal nerve fiber layer loss in glaucoma
Systematic review
It is not a RCT and has less than 100 patients
• "Medeiros, Felipe Andreade, Borges, Adriana S, and Susanna J-nior, Remo. Alteração longitudinais na espessura da camada de fibras nervosas da retina após trabeculectomia

It is not a RCT and has less than 100 patients

"Mehrotra, A. N., Jain, B. S., and Anand, G. S. Comparative evaluation of pilocarpine 2% and combined guanethidine 1% & adrenaline 0.5% in the treatment of chronic simple glaucoma. Indian J Ophthalmol 87 ;35 (3): 146-8.

Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not address any key questions

"Mehta, N. H., Simmons, S. T., and Alphagan/Trusopt Study Group. THE SAFETY AND EFFICACY OF BRIMONIDINE AND DORZOLAMIDE AS CONCOMITANT THERAPY IN PRIMARY OPEN ANGLE GLAUCOMA AND OCULAR HYPERTENSION Meeting abstract


No subjects with open-angle glaucoma

"Meirelles, Sergio Henrique Sampaio, Liporaci, Simone Duarte, Bloise, Renata Rianelli, and -vila, Ediane Gongalves. Resultado em longo prazo da trabeculectomia no tratamento do glaucoma congWnito primario

Foreign language

Meirelles, Sergio Henrique Sampaio,Mathias, Cristina Rodrigues,Wagner, Raquel Young,-vila, Ediane Gongalves,Alves, Simone de Ara-jo,Ferreira, DWnia Rezende. Trabeculoplastia com Laser de Argônio e com Laser de Diodo - Anblise comparativa de 2 anos de seguimento. Rev. bras. oftalmol 2003; 62(10): 727-732. It is not a RCT and has less than 100 patients


Does not address any key questions

"Melamed, S. and David, R. Ongoing clinical assessment of the safety profile and efficacy of brimonidine compared with timolol: Year-three results

Medical KQ 3 or KQ 3 and KQ 6 only

"Melamed, S., Bossawska, I., Laroch, C., and Bimatoprost Adjunctive to Timolol Study Group. : Effectiveness of Bimatoprost (LUMIGAN) as Adjunctive Therapy with Topical Beta-blockers in Patients with Glaucoma or Ocular Hypertension: A 3-Month, Multi-center, Double-masked, Randomized, Vehicle-controlled Trial with Double-masked Extension of Bimatoprost Treatment to 1 Year Meeting abstract

"Melamed, S., Goldenfeld, M., and Simo, G. A Prospective, Randomized Study to Compare a Gold Micro Shunt With the Ahmed Glaucoma Valve in Glaucoma Patients

Meeting abstract

"Melamed, S., Nordmann, J., Yannoulis, N., Mertz, B., Schwenninger, C., and Kapik, B. The efficacy and safety of unoprostone isopropyl 0.15%, timolol maleate 0.5%, and betaxolol hydrochloride 0.5% in patients with primary open-angle glaucoma or ocular hypertension. Month 12 data Meeting abstract


It is not a RCT and has less than 100 patients

"Mello e Oliveira, Nilson de, Porto, Ricardo B, Freitas, Telam Gondim, and Lacava, Augusto Cezar. Estudo comparativo entre a eficiencia da trabeculectomia com e sem uso de 5-Fluorouracil ou Mitomina -C

Foreign language

"Membrey, W. L, Hitchings, R. A, Poinoosawmy, D., and Bunce, C. Trabeculectomy in Normal-Tension Glaucoma (NTG) 2 Year Results: Intraocular Pressure (IOP) Control and Complications Meeting abstract

Does not address any key questions


It is not a RCT and has less than 100 patients


It is a case series

• "Merkle, W. [Effect of methazolamide on the intraocular pressure of patients with open-angle glaucoma (author's transl)]. Klin Monbl Augenheilkd 80 ;176 (1): 181-5 .

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• "Merkle, W. Effect of methazolamide on the intraocular pressure of patients with open-angle glaucoma Duplicate "

• "Mermoud, A., Herbort, C. P., Schnyder, C. C., and Pittet, N. [Comparison of the effects of trabeculoplasty using the Nd-YAG laser and the argon laser]

Foreign language


It is a case series


It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients

• "Merte, H. J. and Merkle, W. [Experiences in a double-blind study with different concentrations of timolol and pilocarpine (author's transl)]. Klin Monbl Augenheilkd 80 ;177 (4): 443-50 .

It is not a RCT and has less than 100 patients

• "Merte, H. J., Heilmann, K., and Hollwich, I. [Investigations on the effect of various doses of acetazolamide (Diamox) on intraocular pressure (author's transl)]

Foreign language

• "Merte, H. J., Stryz, J. R., and Mertz, M. [Comparative studies of initial pressure reduction using 0.3% metipranol and 0.25% timolol in eyes with wide-angle glaucoma]. Klin Monbl Augenheilkd 83 ;182 (4): 286-9 .

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Merte, H. J., Stryz, J. R., and Mertz, M. Pindolol eye drops: Six months follow-up of an antiglaucomatous therapy: PINDOLOL-AUGENTROPFEN (GLAUCO-VISKEN(registered trademark)): HALBJAHRESERGEBNISSE EINER GLAUKOMTHERAPIE. KLIN. MONATSBL. AUGENHEILKD. 84 ;184 (3): 227-232 .

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• "Meschi, C., Aydin, N., and Erbil, H. H. Twenty-four-hour Intraocular Pressure Control With Latanoprost-timolol-fixed Combination Versus Bimatoprost in Patients Who Switched From Timolol. J Glaucoma 2010 ; Does not include treatment for open-angle glaucoma (medical, surgical or combined; See addendum for list of interventions), Other (specify): not included drug "

• "Meschi, C., Aydin, N., and Erbil, H. H. Twenty-four-hour Intraocular Pressure Control With Latanoprost-timolol-fixed Combination Versus Bimatoprost in Patients Who Switched From Timolol. J Glaucoma 2010 ; Other (specify):Latanoprost-timolol-fixed Combination not included"

• "Messmer, C., Stumpfig, D., and Flammer, J. [Effect of betaxolol and timolol on visual fields in glaucoma patients]

Foreign language

• "Messmer, C., Stumpfig, D., and Flammer, J. Influence of betaxolol and timolol on the visual field in glaucoma patients: EINFLUSS VON BETAXOLOL UND TIMOLOL AUF DAS GESICHTSFELD BEI GLAUKOMPATIENTEN

Duplicate "

D-112

It is a case series

• "Meyer, J. and Samples, J. EFFICACY OF DORZOLAMIDE IN GLAUCOMA SUBPOPULATIONS INCLUDING PEDIATRIC AND SECONDARY GLAUCOMAS

Meeting abstract


It is a case series

• "Michalikova, L., Ferkova, S., Jakabovicova, E., and Strmen, P. Antimetabolites in glaucoma surgery - The long term study: Antimetabolity v chirurgii glaukomu - Dlhodobe vysledky

Foreign language

• "Michaud, J. E. and Friren, B. Comparison of topical brinzolamide 1% and dorzolamide 2% eye drops given twice daily in addition to timolol 0.5% in patients with primary open-angle glaucoma or ocular hypertension

Medical KQ 3 or KQ 3 and KQ 6 only

• "Michelson, G., Junemann, A., Hanel, B., and Naumann, G. O. [Intraocular pressure after filtering operation or combined filter-cataract operation]

Foreign language


OAG can't be analyzed separately


OAG can't be analyzed separately


Data not abstractable


OAG can't be analyzed separately

• "Mietz, H., Jacobi, P. C, and Krieglstein, G. K. Postoperative topical versus intraoperative episcleral application of mitomycin for trabeculectomy in secondary glaucoma and repeat trabeculectomy

Meeting abstract

• "Mietz, H., Jacobi, P. C, and Krieglstein, G. K. [Trabeculectomy in complicated glaucoma: Topical application of mitomycin]

Meeting abstract


OAG can't be analyzed separately


OAG can't be analyzed separately


Meeting abstract


Meeting abstract


Other (specify):No control group"


It is a case series


Data not abstractable

• "Migdal, C. and Hitchings, R. Morbidity following prolonged postoperative hypotony after trabeculectomy. Ophthalmic Surg 88;
• 19 (12): 865-7.

**It is not a RCT and has less than 100 patients**


**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**


**Meeting abstract**

"Migdal, C., Gregory, W., and Hitchings, R. Long-term functional outcome after early surgery compared with laser and medicine in open-angle glaucoma. Ophthalmology 94 ;

101 (10): 1651-6; discussion 1657.

**Data not abstractable**

"Miglior, S., Grunden, J. W., and Kwok, K. Efficacy and safety of fixed combinations of latanoprost/timolol and dorzolamide/timolol in open-angle glaucoma or ocular hypertension. Eye (Lond) 2010 ;

24 (7): 1234-42.

**Other (specify):not fda approv drug”


**Meeting abstract**


**Meeting abstract**

"Miglior, S., Torri, V., Zeyen, T., Pfeiffer, N., Vaz, J. C., and Adamsons, I. Intercurrent factors associated with the development of open-angle glaucoma in the European glaucoma prevention study EMGT "


44 (2): 209; author reply 209.

**No original data (e.g., systematic review, narrative review, editorial, letter)**

"Miki, H. and Miki, K. The effects on the intraocular pressure and visual field resulting from a switch in the treatment from timolol to betaxolol. J Ocul Pharmacol Ther 2004 ;


**It is not a RCT and has less than 100 patients**


**Meeting abstract**

"Miller, H. A. and Morlot, C. [Preliminary note on the use of the pilocarpine Ocusert in primary glaucoma]

**Foreign language**


**Data not abstractable**


**OAG can’t be analyzed separately**

"Mills, K. B. and Wright, G. A blind randomised cross-over trial comparing metipranolol 0.3% with timolol 0.25% in open-angle glaucoma: a pilot study

**Unique comparators**

"Mills, K. B. Blind randomised non-crossover long-term trial comparing topical timolol 0.25% with timolol 0.5% in the treatment of simple chronic glaucoma

**KQ 3 RCT "**

OAG can’t be analyzed separately


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is a case series


OAG can’t be analyzed separately

- "Ming, Y. Z. [The ocular hypotensive effect and side reactions of domestic clonidine eyedrops]

Foreign language


It is not a RCT and has less than 100 patients

- "MISHIMA Saiichi, AZUMA Ikuo, AIZAWA Futaba, TAKAHASHI Nobuo, TANAKA Yasuo, IWATA Kazuo, TOMONO Masaaki, NAMBA Katsuhiko, KITAZAWA Yoshiaki, TAKASE Masahiroyo, FUTEMMA Minoru, MATSURO Harutake, HAMADA Minejiro, OGAWA Tetsuro, KOMOTO Shoichi, KAGEYAMA Mariko, SHINRIKI Shimo, ENDO Yohko, EIRAKU Hiroto, YOSHIDA Kimio, YASUDA Noriko, TANE Sadanao, ISHIKAWA Kiyoshi, AOKI Sache, SHIMIZU Naokata, and et, a. I. Clinical Evaluation of Timolol in the Treatment of Patients with Ocular Hypertension and Primary Open Angle Glaucoma Who have been Controlled on Pilocarpine -Double blind study-. Rinsho Hyoka (Clinical Evaluation) 80 ;8 (3): 789-820 .

Other (specify):"

- "MISHIMA Saiichi, AZUMA Ikuo, TAKASE Masahiro, AIZAWA Futaba, SOMA Keiko, KATSUSHIMA Harumi, KIMURA Ryozo, NANBA Hisayoshi, KOMURO Sono, YANAGISAWA Yoriko,

KAMEYAMA Kazuko, MIYASAKA Yumiko, KIKUCHI Ryuzi, KOIKE Yuji, TOKORO Takashi, YAGI Takashi, MATSURO Harutake, HAMADA Rejiro, OGAWA Tetsuro, NAKANO Naoki, UEDA Tatsuko, TONO Iwao, INAGAKI Masayasu, SHIMIZU Nobuo, SHIMIZU Naokata, and et, a. I. Clinical Evaluation of Bupranolol Hydrochloride Drop in the Treatment of Primary Open Angle Glaucoma and Ocular Hypertension - Multi Center Double-Blind Study in Comparison with Pilocarpine Drop-

Foreign language


Medical KQ 3 or KQ 3 and KQ 6 only


Other (specify):not FDA approved"


Does not address any key questions


It is not a RCT and has less than 100 patients


Does not address any key questions

- "Miura, K., Ito, K., Okawa, C., Sugimoto, K., Matsunaga, K., and Uji, Y. Comparison of ocular hypotensive effect and safety of brinzolamid and timolol added to latanoprost

Unique comparators


Does not address any key questions

- "Mizoguchi, T., Nagata, M., Matsumura, M., Kuroda, S., Terauchi, H., and Tanihara, H. Surgical effects of combined trabeculotomy and

Other (specify): Not a treatment modality of interest

*"Mizokami, K. and Tanaka, Y. [Comparison of a trabeculotomy and trabeculectomy combined with phacoemulsification and foldable lens implantation]

Foreign language


OAG can’t be analyzed separately

*"Mochizuki, M. and Kitazawa, Y. Trabeculectomy: a follow up study

Foreign language


*It is a case series

*"Molino, F., Frau, B., Semino, E., Venzano, D., and Traverso, C. E. IOP-LOWERING.EFFECT OF DORZOLAMIDE 2% VERSUS BRIMONIDINE TARTRATE 0.2%. A PROSPECTIVE RANDOMIZED CROSS OVER STUDY

Meeting abstract


*It is a case series


*It is a case series


*It is a case series


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


*It is a case series

*"Montaño Moreno, Gustavo, Babaybn Mena, Juan Ignacio, and Escudero Bache, Eduardo. Trabeculectomía: an análisis retrospectivo de 100 casos

Foreign language


*It is not a RCT and has less than 100 patients

*"Montoro, J. B., Laluela, P., Cano, S. M., Escobar, C., and Linares, F. Drop size and systemic adverse effects in timolol ophthalmic solution

Unique comparators

*"Montoya Pizarro, Olga. Eficacia comparativa del Betaxol y el Timolol

Library can’t find"

*"Mori, K. and Kawashima, A. Crossover Comparative Study of Betaxolol and Timolol Effect on Retinal Circulation in Glaucoma and Ocular Hypertension

Meeting abstract


*Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Moriarty, B. J., Char, J. N., Acheson, R. W., and Dunn, D. T. Argon laser trabeculoplasty in primary open-angle glaucoma--results in black Jamaican population
  Rolim de Moura 2009
• Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• Does not address any key questions
• "Mortada, A. Role of pre and post operative diuretics (acetazolamide) when given with tranquilizers (chlorpromazine) for quick formation of anterior chamber with cataract extraction partial penetrating keratoplasty and glaucoma fistulising operations. BULL. OPHTHALMOL. SOC. EGYPT 73 ;66 (70): 185-191 .
• It is a case series
• "Moschos, M., Brouzas, D., and Papantonis, F. Extracapsular cataract extraction and posterior chamber lens in the management of phacolytic glaucoma. EUR. J. IMPLANT REFRACTIVE SURG. 93 ; 5 (2): 145-147 .
• It is combined cataract/glaucoma surgery study published before April 2000
• Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Moss., A., Ritch, R., and Hargett, N. Comparison of timolol and epinephrine on intraocular pressure of humans. INVEST. OPHTHALMOL. VIS. SCI. 78 ; 17 (Suppl.): 122 .
• It is not a RCT and has less than 100 patients
• "Mostafaei, A. Augmenting trabeculectomy in glaucoma with subconjunctival mitomycin C versus subconjunctival 5-fluorouracil: a randomized clinical trial. Clin Ophthalmol 2011 ; 5; status =Nikoukari Ophthalmology University Hospital, Tabriz University of Medical Sciences, Tabriz, Iran.
• : 491-4 .
• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• No original data (e.g., systematic review, narrative review, editorial, letter)
  Meeting abstract
• "Motolko, M. A. Comparison of allergy rates in glaucoma patients receiving brimonidine 0.2% monotherapy versus fixed-combination brimonidine 0.2%-timolol 0.5% therapy. Curr Med Res Opin 2008 ; 24 (9): 2663-7 .
  Other (specify):combination not FDA approved?"
• It is a case series
• "Moulin, F. and Haut, J. [Argon laser trabecuoplasty. Results over 10 years] Foreign language
• "Moulin, F. and Haut, J. [Results of argon laser treatment of 100 eyes with open-angle glaucoma (trabecuoplasty, trabeculoretraction)]
  Foreign language
• Does not address any key questions
• "Moulin, F., Ameline, B., Redor, Y., Bey Boumerzag, A., and Haut, J. [Trabeculoretraction by argon laser. 5 and 8-year results]
  Foreign language
- Does not address any key questions
- "Moulin, F., Haut, J., Le Mer, Y., and Vidal-Cherbonneau, A. [Adverse effects and complications of argon laser trabecular retraction: practical results] Foreign language
- It is a case series
- "Mqrula, Rafael Vidal, Diniz Filho, Alberto, Gomes, Roberto de Alencar, Cronemberger, SebastiPo, and Calixto, Nassim. Espessura corneana central e densidade das células endoteliais corneanas centrais após trabeculectomia com e sem mitomicina C Foreign language
- OAG can’t be analyzed separately
- "Muermans, M., Faubert, J., Overbury, O., and Balazsi, A. G. THE ACUTE EFFECTS OF TIMOLOL MALEATE ON TEMPORAL MODULATION FIELDS AND SPATIAL CONTRAST SENSITIVITY Meeting abstract
- "Mukhina, E. A. [Experience with simultaneous cataract extraction and trabeculectomy] Foreign language
- "Mulaney, J., Sonty, S., Ahmad, A., Stewart, J. A., and Stewart, W. C. Comparison of daytime efficacy and safety of dorzolamide/timolol maleate fixed combination versus latanoprost Medical KQ 3 or KQ 3 and KQ 6 only Meeting abstract
- "Mundorf, T. K and Dirks, M. Efficacy of Brimonidine Purite 0.15% Compared With Timolol 0.5% in Patients With Glaucoma and Ocular Hypertension Meeting abstract
- "Mundorf, T. K., Noecker, R., and Earl, M. A Multicenter, Investigator-Masked, Randomized Comparison of the IOP-Lowering Efficacy of Bimatoprost 0.03% versus Travoprost 0.004% in African Americans with Glaucoma or Ocular Hypertension Meeting abstract
- "Mundorf, T. K. and Brimonidine Outcomes Study Group, I. I. BRIMONIDINE 0.2% VERSUS BETAXOLOL 0.25% AS MEASURED BY THE CLINICAL SUCCESS RATE AND QUALITY OF LIFE EFFECTS IN PATIENTS WITH GLAUCOMA OR OCULAR HYPERTENSION Meeting abstract
- "Mundorf, T. K., Batoosingh, A. L., Safyan, E., and Liu, C. C. R. Three-Month Comparison Study of Brimonidine Purite 0.1 % and 0.15% for Reducing IOP in Glaucoma and Ocular Hypertension Meeting abstract
- "Mundorf, T. K., Noecker, R., Earl, M., and Frenkel, R. Brimonidine Purite 0.15% versus Dorzolamide 2% Used as Adjunctive Therapy to Latanoprost Meeting abstract
- "Mundorf, T. K., Ogawa, T., Novack, G. D., Crockett, R. S., and US ISTALOL Study Group. A Double-masked, Randomized, Parallel Study of the Safety and Efficacy of Timolol-LA in Patients with Ocular Hypertension or Open-angle Glaucoma Meeting abstract
- Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Mundorf, T., Dirks, M., Nocker, R. J., and Earl, M. Brimonidine Purite 0.15% versus Timolol 0.5% as Adjunctive Therapy with Lipids
  Meeting abstract
• "Mundorf, T., Noecker, R. J., and Earl, M. L. A Multicenter, Randomized, Investigator-Masked Comparison of the Efficacy of Bimatoprost 0.03% versus Travoprost 0.004% in African Americans with Glaucoma or Ocular Hypertension
  Meeting abstract

  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Mundorf, T., Williams, R., Whitcup, S., Felix, C., and Batoosingh, A. A 3-month comparison of efficacy and safety of brimonidine-purite 0.15% and brimonidine 0.2% in patients with glaucoma or ocular hypertension
  Unique comparators

  It is combined cataract/glaucoma surgery study published before April 2000

  Does not address any key questions

  OAG can’t be analyzed separately
• "Musch, D. C, Gillespie, B. W, Lichter, P. R., Nizioł, L. M., and Janz, N. K. Visual field progression in the Collaborative Initial Glaucoma Treatment Study the impact of treatment and other baseline factors
  CIGTS--part of 639 now

  Other (specify):Study design does not match KQ

  Other (specify):link to CIGTS

  OAG can’t be analyzed separately

  Other (specify):only 82 percent over 40"

  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Nagar, M., Shah, N., and Luhishi, E. Effect of Selective Laser Trabeculoplasty and Prostaglandins on Diurnal IOP Fluctuations: Randomized Clinical Trial
  Meeting abstract
- "Nagasubramanian, S. and Hitchings, R. A. Comparison of Apraclonidine and Timolol in Chronic Open-Angle Glaucoma -- Three-Month Study
  Meeting abstract
  Other (specify): not an FDA drug"
- "Nagasubramanian, S., George, J. L., Honrubia, F. L., Airaksinen, J., and Serra, M. A THREE-MONTH, TRIPLE-MASKED, ADJUNCTIVE-THERAPY STUDY OF THE EFFICACY AND SAFETY OF BID-DOSED BRINZOLAMIDE 1% OPHTHALMIC SUSPENSION AND DORZOLAMIDE 2% OPHTHALMIC SOLUTION (TRUSOPT) IN THE TREATMENT OF PATIENTS WITH POAG OR OH MAINTAINED ON TIMOLOL THERAPY
  Meeting abstract
  Does not address any key questions
  Does not address any key questions
  Other (specify): not used drugs"
- "Nakamoto, K. and Yasuda, N. Effect of concomitant use of latanoprost and brinzolamide on 24-hour variation of IOP in normal-tension glaucoma
  Unique comparators
- "Nakamoto, K., Yasuda, N., Nanno, M., and Fukuda, T. [Comparison of the effects of latanoprost and timolol gel-forming solution on diurnal variation of intraocular pressure in normal-tension glaucoma]
  Foreign language
  Data not abstractable
  Other (specify): Mixed glaucomas for analysis of side effects"
- "Nakatani, H., Maeda, K., and Sumie, K. The pilocarpine ocusert system. Long-term clinical trials in the management of glaucoma or ocular hypertension
  Foreign language
- "Narayanaswamy, A., Neog, A., Baskaran, M., George, R., Lingam, V., Desai, C., and Rajadhlyaksha, V. A randomized, crossover, open label pilot study to evaluate the efficacy and safety of Xalatan in comparison with generic Latanoprost (Latanprost) in subjects with primary open angle glaucoma or ocular hypertension
  Unique comparators
  OAG can't be analyzed separately
  Data not abstractable
  Data not abstractable
  It is combined cataract/glaucoma surgery study published before April 2000
- "Naveh-Floman, N., Blumenthal, M., and Belkin, M. [Complications of medical therapy in glaucoma]
  Foreign language

No subjects with open-angle glaucoma


No subjects with open-angle glaucoma, No original data (e.g., systematic review, narrative review, editorial, letter)


It is not a RCT and has less than 100 patients


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is not a RCT and has less than 100 patients


It is a case series


It is a case series


Other (specify):summary of FDA AE reports; no denominator"


It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients


It is a case series


Foreign language

"Netland, P. A and Kenneth Sullivan, E. K. EFFECT OF TRAVOPROST ON IOP IN BLACK AND NON-BLACK PATIENTS WITH OCULAR HYPERTENSION AND OPEN-ANGLE GLAUCOMA IN A TWELVE-MONTH STUDY

Meeting abstract


Meeting abstract

"Netland, P. A. and Travoprost Study Group. SAFETY AND EFFICACY OF TRAVOPROST IN THE TREATMENT OF OPENANGLE GLAUCOMA OR OCULAR HYPERTENSION IN COMPARISON WITH LATANOPROST AND TIMOLOL

Meeting abstract


Medical KQ 3 or KQ 3 and KQ 6 only

"Netland, P. A., Michael, M., Rosner, S. A., Katzman, B., and Macy, J. I. Brimonidine Purite and bimatoprost compared with timolol and

**Other (specify): excluded drug**

**Medical KQ 3 only**
**Medical KQ 3 or KQ 3 and KQ 6 only**
- "Netland, P. A., Shapiro, A., and Chapin, M. DUAL THERAPY USING BRIMONIDINE WITH LATANOPROST COMPARED TO TIMOLOL-DORZOLAMIDE COMBINATION THERAPY
**Meeting abstract**
**Meeting abstract**
**Duplicate**
- "Netland, P. A., Sullivan, E., Andrew, R., Silver, L., Weinger, A., Mallick, S., Dickerson, J., Bergamini, M., Robertson, S., and Davis, A. Travoprost compared with Latanoprost and Timolol as primary therapy
**Meeting abstract**

**OAG can’t be analyzed separately**

**Meeting abstract**

**Meeting abstract**
- "Niazi, M. K. and Raja, N. Comparison of latanoprost and dorzolamide in the treatment of patients with open angle glaucoma
**Medical KQ 3 or KQ 3 and KQ 6 only**
- "Niedermeyer, S. [Bivalent vegetative glaucoma therapy]
**Foreign language**
- "Nielsen, N. V. A diurnal study of the ocular hypotensive effect of metoprolol mounted on ophthalmic rods compared to timolol eye drops in glaucoma patients. Acta Ophthalmol (Copenh) 81 ;59 (4): 495-502
**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**
**Other (specify): Metoprolol not an intervention of interest**
**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**
**It is not a RCT and has less than 100 patients**
**Foreign language**
**Other (specify): pilocarpine**

D-122
Does not address any key questions


It is a case series

- "Nixon, D. R. and Hollander, D. Comparison of the Efficacy and Tolerability of Twice-Daily Combigan vs. Cosopt Fixed-Combination Therapies

Meeting abstract

- "Nixon, D. R. Evaluation of the Safety and Efficacy of Brimonidine Tartrate-Timolol Maleate Ophthalmic Solution (Combigan®) and Dorzolamide Hydrochloride-Timolol Maleate Ophthalmic Solution (Cosopt®) in Patients with Open-Angle Glaucoma or Ocular Hypertension

Meeting abstract

- "Nixon, D. R., Yan, D. B., and Hollander, D. A. Randomized, Parallel Comparison of the Efficacy and Tolerability of Twice-Daily 0.2% Brimonidine/0.5% Timolol (Combigan®) vs. 2.0% Dorzolamide/0.5% Timolol (Cosopt®) Fixed Combination Therapies in Patients with Glaucoma or Ocular Hypertension

Meeting abstract


Medical KQ 3 or KQ 3 and KQ 6 only


Systematic review


It is combined cataract/glaucoma surgery study published before April 2000

- "Noecker, R. Intraocular pressure-lowering efficacy of bimatoprost 0.03% and travoprost 0.004% in patients with glaucoma or ocular hypertension. Br J Ophthalmol 2006;90 (11): 1336-7.

No original data (e.g., systematic review, narrative review, editorial, letter)

- "Noecker, R. J. and Bulau, S. A. COMPARISON OF EFFICACY OF ALPHAGAN VERSUS TRUSOPT IN MEXICAN-AMERICANS

Meeting abstract

- "Noecker, R. J. and Earl, M. Comparison of the IOP-Lowering Efficacy of Bimatoprost and Travoprost in Black Patients With Glaucoma or Ocular Hypertension

Meeting abstract


OAG can’t be analyzed separately

- "Noecker, R. J. Evaluation of Bimatoprost 0.03% versus Latanoprost 0.005%: A Paired Comparison Study

Meeting abstract

- "Noecker, R. J., Dirks, M., Mundorf, T., Williams, R., and Earl, M. Evaluation of Bimatoprost 0.03% versus Latanoprost 0.005%: A Bilateral Monocural Trial

Meeting abstract

- "Noecker, R. J., Earl, M. L., Mundorf, T. K., Silverstein, S. M., and Phillips, M. P. Comparing bimatoprost and travoprost in black Americans Medical KQ 3 or KQ 3 and KQ 6 only

- "Noecker, R. J., Earl, M. L., Mundorf, T., Peace, J., and Williams, R. D. Bimatoprost 0.03% versus travoprost 0.004% in black Americans with glaucoma or ocular hypertension Medical KQ 3 or KQ 3 and KQ 6 only


No original data (e.g., systematic review, narrative review, editorial, letter)

- "Noecker, R. S., Dirks, M. S., and Choplin, N. A six-month randomized clinical trial comparing the intraocular pressure-lowering efficacy of bimatoprost and latanoprost in patients with ocular hypertension or glaucoma KQ 3 medical"

- "Noecker, R., Bulau, S., and Kay, J. EFFICACY AND TOLERABILITY OF ALPHAGAN AND TRUSOPT IN MEXICAN-AMERICAN PATIENTS WITH GLAUCOMA OR OCULAR HYPERTENSION

Meeting abstract
• "Nomura, Y., Nakakura, S., Moriwaki, M., Takahashi, Y., and Shiraki, K. Effect of travoprost on 24-hour intraocular pressure in normal tension glaucoma. 2010 ;4 (1): 643-647. It is not a RCT and has less than 100 patients
• "Norden, L. C. Adverse reactions to topical ocular autonomic agents. J Am Optom Assoc 78 ;49 (1): 75-80. No original data (e.g., systematic review, narrative review, editorial, letter)
• "Nordmann, J. P., Rouland, J. F., and Mertz, B. P. A comparison of the intraocular pressure-lowering effect of 0.5% timolol maleate and the docosanoid derivative of a PGF2 alpha metabolite, 0.12% unoprostone, in subjects with chronic open-angle glaucoma or ocular hypertension. Curr Med Res Opin 99 ;15 (2): 87-93. Other (specify):unoprostone and PGF2"
• "Nordmann, J.-P., Soderstrom, M., Rouland, J.-F., and Malecaze, F. Comparison of the intraocular pressure lowering effect of latanoprost and a fixed combination of timolol-pilocarpine eye drops in patients insufficiently controlled with (beta) adrenergic antagonists Duplicate"
• "Norell, S. E. and Granstrom, P. A. Self-medication with pilocarpine among outpatients in a glaucoma clinic. Br J Ophthalmol 80 ;64 (2): 137-41. Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Norell, S. Medication behaviour. A study of outpatients treated with pilocarpine eye drops for primary open-angle glaucoma. Acta Ophthalmol Suppl 80 ;(143): 1-28. Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Norris, Eleonore J, Schiffman, Joyce C, Palmberg, Paul F, and Mello, Paulo Augusto de Arruda. Resultado a longo prazo do uso de drogas antiproliferativas na trabeculectomia primbria Foreign language
• "Noske, W., Pahlitzsch, T., and Kirchner, J. Effect of indometacin on the ocular hypertension after cataract extraction. A double-blind study: EFFET DE L'INDOMETACINE SUR L'HYPERTENSION OCULAIRE APRES OPERATION DE LA CATARACTE. ETUDE EN DOUBLE AVEUGLE Foreign language

Data not abstractable

• "Novack, G. D., David, R., Lee, P. F., Freeman, M. I., Duzman, E., and Batoosingh, A. L. Effect of changing medication regimens in glaucoma patients

Medical KQ 3 or KQ 3 and KQ 6 only


It is a case series

• "Novack, G. D., Mundorf, T. K., Ogawa, T., Crockett, R. S., and US/ISTALOL Study Group. Randomized, Controlled, One-Year Treatment Comparison of Timolol-LA (ISTALOL® trade;) Given q.d. vs Timolol Maleate Solution Given b.i.d. in Patients With Ocular Hypertension or Open-Angle Glaucoma

Meeting abstract


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


No subjects with open-angle glaucoma

• "Novakovic, A., Vujosevic, E., Alajbegovic, R., and Hodzic, S. [2 years' administration of timolol to patients with chronic open-angle glaucoma]

Foreign language


No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)

• "Nuzzi, R., Finazzo, C., and Cerruti, A. Adverse effects of topical antiglaucomatous medications on the conjunctiva and the lachrymal (Brit. Engl) response

Excluded drug


It is not a RCT and has less than 100 patients

• "Oancea, I., Pop, R., Calugaru, M., Grigorescu, R., Vladutiu, C., Sandovici, E. M., Popa, L., Marin, C., Lazarov, E., and Trif, V. [Early results following trabeculectomy at the Cluj-Napoca Ophthalmological Clinic]

Foreign language


It is not a RCT and has less than 100 patients


Meeting abstract


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• "Ober, M., Scharrer, A., and David, R. Long-term ocular hypotensive effect of levobunolol: Results of a one-year study

Medical KQ 3 or KQ 3 and KQ 6 only

• "Ober, M., Scharrer, A., Novack, G. D., and Lue, J. C. [Local subjective tolerance of levobunolol and metipranolol in a double-blind comparative study in patients with increased intraocular pressure]. Ophthalmologica 86 ;192 (3): 159-64 .

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "O'Brart, D. P., Rowlands, E., Islam, N., and Noury, A. M. A randomised, prospective study comparing trabeculectomy augmented with antimetabolites with a viscosocanalostomy technique for the management of open angle glaucoma uncontrolled by medical therapy

Cheng 2009 and Chai 2010

• "O'Brart, D. P., Shiew, M., and Edmunds, B. A randomised, prospective study comparing trabeculectomy with viscosocanalostomy with adjunctive
antimetabolite usage for the management of open angle glaucoma uncontrolled by medical therapy

Cheng 2009 and Chai 2010

• "O'Brart, D., Noury, S., Rowlands, E., and Islam, N. A prospective, randomized study to compare Trabeculectomy with Viscocanalostomy technique for the management of open angle glaucoma uncontrolled by medical therapy

Meeting abstract

• "O'Brart, D., Rowlands, E., and Islam, N. A randomised, prospective study comparing trabeculectomy with viscocanalostomy for the management of open angle glaucoma uncontrolled by medical therapy: 12 month follow-up

Meeting abstract


Duplicate


Does not address any key questions


Other (specify): not used as a drug at present"


No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)


It is a case series


No original data (e.g., systematic review, narrative review, editorial, letter)

• "Oddone, F., Manni, G., Parravano, M., Cupo, G., Costa, G., and Bucci, M. G. Six-Months Comparison of the Efficacy and Safety of Bimatoprost 0.03% Versus the Association of Timolol 0.5% and Latanoprost 0.005%

Meeting abstract


It is a case series

• "O'Donoghue, E. P. A comparison of latanoprost and dorzolamide in patients with glaucoma and ocular hypertension: a 3 month, randomised study. Ireland Latanoprost Study Group

Medical KQ 3 or KQ 3 and KQ 6 only

• "O'Donoghue, E. P. A comparison of latanoprost and dorzolamide in patients with glaucoma and ocular hypertension: A 3 month, randomised study

Medical KQ 3 or KQ 3 and KQ 6 only

• "O'Donoghue, E. P. STRONTIUM 90 VS 5-FU AS ADJUNCT TO SURGERY FOR PATIENTS AT HIGH RISK OF TRABECULECTOMY FAILURE: A PROSPECTIVE RANDOMISED TRIAL

Meeting abstract

• "O'Donoghue, E. P., Saunders, D. C., Ayliffe, W., and Ridgway, A. E. A. STRONTIUM 90 VS 5-FU AS ADJUNCT TO SURGERY FOR PATIENTS AT HIGH RISK OF TRABECULECTOMY FAILURE: A PROSPECTIVE RANDOMISED TRIAL

Meeting abstract

• "Offret, H. and Bechetoille, A. [Medical treatment of wide-angle chronic glaucoma]

Foreign language


It is not a RCT and has less than 100 patients


It is combined cataract/glaucoma surgery study published before April 2000
• "O'Grady, J., Juzych, M., Shin, D., Swendris, R., Parrow, K., and Stewart, D. GLAUCOMA TRIPLE PROCEDURE WITH AND WITHOUT ADJUNCTIVE 5 FLUOROURACIL
  Meeting abstract

  No original data (e.g., systematic review, narrative review, editorial, letter)

  It is not a RCT and has less than 100 patients

  It is not a RCT and has less than 100 patients

• "Ohrstrom, A., Kattstrom, O., Polland, W., Mortensen, J., and Stenstrom, B. Oral and topical adrenergic beta-receptor blockers in glaucoma treatment. A multicenter study
  Excluded drug

• "Ohta, H., Uji, Y., Hattori, Y., Sugimoto, M., and Higuchi, K. [Seasonal variation of intraocular pressure after trabeculotomy]
  Foreign language

• "Ohtake, Y., Tanino, T., Kimura, I., Mashima, Y., and Oguchi, Y. [Long-term efficacy and safety of combined topical antiglaucoma therapy--timolol & unoprostone vs. betaxolol & unoprostone]
  Foreign language

• "Oksala, A. and Salminen, L. [Influence of pilocarpine on ocular tension in new chronic glaucoma cases]
  Foreign language

• "Oksala, A. and Salminen, L. [Tachyphylaxis in chronic timolol-treated glaucoma]
  Foreign language

• "Oksala, A., Salminen, L., and Palkama, A. [Comparative study of timolol and pilocarpine in chronic glaucoma]
  Foreign language

  Other (specify):post hoc analysis

  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Olivalves, Edilberto, Olivalves, Stella, and Tortelli, Liliane. Comparação do efeito do maleato de timolol e pilocarpina na queda da pressão intraocular
  Foreign language

• "Oliveira, Maria Vitoria F. de, Brasil, Oswaldo Ferreira Moura, Gorgalves, Isabel, Meirelles, Sergio Henrique Sampaio, and Costa Filho, Adroaldo de Alencar Costa. Utilização do laser de argônio para o extravasamento da bolha filtrante
  Foreign language

  Does not address any key questions

• "Oliver, M., Bartlett, J., Richardson, T., Whitaker, R., Greenidge, K., and Pensyl, D. OCULAR AND SYSTEMIC TOLERABILITY OF CARTEOLOL AND TIMOLOL IN POSTMENOPAUSAL BLACK WOMEN WITH PRIMARY OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION
  Meeting abstract

  OAG can't be analyzed separately

• "Omi, Carlos Akira, Almeida, Geraldo Vicente de, and Belfort Mattos, Rubens. Estudo duplo mascarado sobre o uso têpico de levobunolol e maleato de timolol em pacientes com glaucoma crônico simples ou hipertensão ocular
  Foreign language

It is a case series

- "Opitz, D., Tung, S., Park, J., and Jang, U. SILICONE PUNCTAL PLUGS AS AN ADJUNCTIVE THERAPY TO TRAVOPROST 0.004% OPHTHALMIC SOLUTION IN PRIMARY OPEN ANGLE GLAUCOMA AND OCULAR HYPERTENSION

Foreign language

- "Orcelli, L. The influence of previous medical therapy on the success of trabeculectomy: Influenza della protratta terapia medica sul successo della trabeculectomia

Foreign language

- "Orengo-Nania, S. D, Landry, T., Von Tress, M., Silver, L. H, Dickerson, J., Weiner, A. L, Davis, A. A, and Travoprost Study Group. Travoprost significantly decreased IOP in patients with open-angle glaucoma or ocular hypertension when used adjunctively with timolol

Meeting abstract

- "Orzalesi, N., Rossetti, L., Bottoli, A., Invernizzi, T., Fumagalli, E., and Fogagnolo, P. Comparison of the effect of latanoprost, travoprost, and bimatoprost on circadian intraocular pressure in patients with glaucoma or ocular hypertension. Meeting abstract

Other (specify): study design does not match KQ (KQ3)"

- "Orzalesi, N., Rossetti, L., Bottoli, A., and Fogagnolo, P. Comparison of the Effect of Latanoprost, Travoprost, and Bimatoprost on Circadian Intraocular Pressure in Patients with Glaucoma or Ocular Hypertension Meeting abstract

Data not abstractable


Medical KQ 3 or KQ 3 and KQ 6 only


- "Orzalesi, N., Rossetti, L., Bottoli, A., Invernizzi, T., Fumagalli, E., and Fogagnolo, P. Comparison of the effect of latanoprost, brimonidine, and a fixed combination of timolol and dorzolamide on circadian intraocular pressure in patients with glaucoma or ocular hypertension Meeting abstract"
"Orzalesi, N., Rossetti, L., Invernizzi, T., and Bottoli, A. A COMPARISON OF THE EFFECT OF TIMOLOL, LATANOPROST, AND DORZOLAMIDE ON CIRCADIAN INTRAOCULAR PRESSURE IN PATIENTS WITH GLAUCOMA OR OCULAR HYPERTENSION Meeting abstract

"Orzalesi, N., Rossetti, L., Invernizzi, T., Bottoli, A., and Autelitano, A. Effect of timolol, latanoprost, and dorzolamide on circadian IOP in glaucoma or ocular hypertension Medical KQ 3 or KQ 3 and KQ 6 only

"Osako, M., Asaoka, R., Tachibana, K., Okano, T., and Usui, M. Evaluation of Corneal Endothelial Cell Reduction Rates After Combined Glaucoma and Cataract Surgery and After Glaucoma Surgery Alone Meeting abstract

"Osborne, S. A., Montgomery, D. M., Morris, D., and McKay, I. C. Alphagan allergy may increase the propensity for multiple eye-drop allergy Unique comparators


"Otori, Y. [Side effects of antiglaucoma eye drops] Foreign language

"Otori, Y., Tokugawa, H., Morimura, H., Okada, M., Goto, H., Miki, A., and Tano, Y. [The effect of substituting latanoprost 0.005% for unoprostone 0.12%] Foreign language

"Ottaviano, Josq Augusto Alves, Moreira, Josq Belmiro de Castro, Fudo, Aurea, Ueda, Eder Masso, Bosso, Evandro Portaluppe, and Martin, Rosana TerWsa Alves Lois. Apraclonidine a 1 por cento em olhos submetidos a trabecuoplastia por laser de argônio Foreign language

"Otto, S. R. and Hoh, H. R. EFFICACY AND OCULAR TOLERANCE OF TIMOLOL-GEL 0.1% (T-GEL 0.1%) ONCE DAILY VERSUS TIMOLOL 0.25% AQUEOUS EYE DROPS TWICE DAILY Meeting abstract

"Ouhadj, O., Degaheb, N., Cherghi, I., and Nouri, M. T. [Late endophthalmitis complicating glaucoma filtering surgery without adjunctive antifibrotic agents] Foreign language

"Ourgaud, A. G. [Adverse effects of local medical treatment in glaucoma] Foreign language


"Oya, Y., Fujii, S., Yoshizawa, T., and Iwata, K. COMPARISON OF NON-PENETRATING LAMELLAR TRAVECULECTOMY WITH PENETRATIN TRABECULECTOMY Meeting abstract


"Pabéñ, Claudia, Fraga, Olga, and Beaujon Balbi, Oscar. Efectos de la dorzolamida latanoprost y combinación dorzolamida-timolol sobre la cfínea Foreign language


"Pager, M. [Problems in estimating the therapeutic results in glaucoma]
Foreign language

OAG can't be analyzed separately
- "Pajic, B., Pajic-Eggspuehler, B., and Hafliger, I. O. Comparison of the effects of dorzolamide/timolol and latanoprost/timolol fixed combinations upon intraocular pressure and progression of visual field damage in primary open-angle glaucoma

Unique comparators

Other (specify): Mixed glaucoma

OAG can't be analyzed separately

Foreign language
- "Palmberg, P., Kim, E. E., Kwok, K. K., and Tressler, C. S. A 12-week, randomized, double-masked study of fixed combination latanoprost/timolol versus latanoprost or timolol monotherapy

Non-FDA-approved drug combination

Data not abstractable

Foreign language
- "Pan, S.-X. and Zhao, G.-Q. Clinical observation of compound trabeculectomy in refractory glaucoma

Foreign language
- "Pan, Y. I, Damji, K. F, Rock, W. J, Bovell, A. M, Buhrmann, R., and Hodge, W. G. Comparing the Time to Treatment Failure Rate at 1-Year Post-Treatment: Results From a SLT vs. ALT Randomized Clinical Trial

Meeting abstract

Other (specify): non English

It is a case series

OAG can't be analyzed separately

Meeting abstract
- "Papaconstantinou, D. S., Georgopoulos, G. T., Patsea, E. S., Chalkiadakis, I., Amariotakis, A., Maragos, A., Iliakis, E., Andreanos, D. G., and Moschos, M. Results of Combined Phacoemulsification and Trabeculectomy

Meeting abstract

Other (specify): Ologen implant not a treatment of interest, Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

It is combined cataract/glaucoma surgery study published before April 2000

It is not a RCT and has less than 100 patients
It is a case series

It is not a RCT and has less than 100 patients

It is a case series

Other (specify): Medication not approved in US
- Paranhos, A., Spadaro, F., Queiroz, C. M, Sagawa, A. P G, and Avila, M. P. Effects of Topical Indomethacin in Patients With Open Angle Glaucoma on Bimatoprost 0.03% Meeting abstract

Foreign language

It is not a RCT and has less than 100 patients

Meeting abstract

It is combined cataract/glaucoma surgery study published before April 2000

Other (specify): Mixed glaucoma

It is not a RCT and has less than 100 patients

Other (specify): Study design does not match KQ

Other (specify): Study design does not match KQ

It is not a RCT and has less than 100 patients
- Park, M., Tanito, M., and Chihara, E. Combined cataract surgery and viscocanalostomy versus Combined cataract surgery and viscocanalostomy with nonpenetrating trabeculectomy Meeting abstract

Meeting abstract
- Parmaksiz, S., Yuksel, N., Karabas, V. L., Ozkan, B., Demirci, G., and Caglar, Y. A comparison of travoprost, latanoprost, and the fixed combination of dorzolamide and timolol in patients with pseudoxfoliation glaucoma Medical KQ 3 only

Meeting abstract
- Parravano, M., Centofanti, M., Palmieri, M., Oddone, F., Migliardi, R., and Bucci, M. G. Preservatives Free Non-Selective β-blockers in the Management of Glaucomatous and Ocular Hypertensive Patients Meeting abstract

Meeting abstract
- Parrish, R. A Comparison of Latanoprost, Bimatoprost, and Travoprost in Patients with Elevated Intraocular Pressure: A 12-Week, Masked-Evaluator, Multicenter Study Meeting abstract

Meeting abstract
- Parrish, R. and Sheu, W. P. Post-hoc Analyses of the XLT Study Results. A Comparison of Latanoprost, Bimatoprost, and Travoprost in Patients...
with Elevated IOP: A 12-week Randomized, Masked-evaluator, Multicenter Study

Meeting abstract
  Does not address any key questions
  Medical KQ 3 or KQ 3 and KQ 6 only
- "Parrish, R., Palmberg, P., and XLT Study Group. Latanoprost, Bimatoprost, and Travoprost in Patients With Elevated Intraocular Pressure: Results of a 12-Week, Masked-Evaluator, Multicenter Study
  Meeting abstract
  Medical KQ 3 or KQ 3 and KQ 6 only
- "Passos, Angelo Ferreira, Cardozo, Alessandra Soares, Mendes, Abraao Garcia, and Batista, Diusete Maria Pavan. RecuperagPo tardia de fÆstulas antigelomatosas pelo agulhamento episcleral associado a injegPo subconjuntival de mitomicina
  Foreign language
- "Pastor Jimeno, J. C. and Eder Labairu, F. Effects of timolol maleate in open-angle glaucoma. Results of a double-blind trial against pilocarpine and a long term study (9 months): EFECTOS DEL MALEATO DE TIMOLOL EN EL GLAUCOMA DE ANGULO ABIERTO. RESULTADOS DE UN ESTUDIO DOBLE CIEGO CON LA PILOCARPINA Y ESTUDIO A LARGO PLAZO (9 MESES)
  Foreign language
  Other (specify):No control group"
  Data not abstractable
  It is not a RCT and has less than 100 patients
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Other (specify):No control group"
  Meeting abstract
  It is a case series
  It is not a RCT and has less than 100 patients
  Foreign language
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Does not address any key questions
• "Pei, C.-G., Zhou, Y., Shao, Y., and Zhou, Q. Clinical study on the application of anterior lens capsule in trabeculectomy combined with cataract surgery
Foreign language
• "Peng, D. W., Lu, L., and Tian, X. [Laser suture lysis following trabeculectomy]
Foreign language
• "Peng, D., Li, S., Li, M., Shao, H., Sun, X., Sheng, Y., Yu, K., Fu, P., Guo, W., Meng, F., Xu, C., and Zhu, Z. [A comparison between latanoprost and timolol in treatment of patients with primary open-angle glaucoma and ocular hypertension]
Foreign language
Foreign language
It is a case series
It is a case series
• "Peralta, G., Candelaria, Eneida de la C, Coba Pena, Maria Josefa, Vigoa Aranguren, Lazaro, and Capote Cabrera, Armando. Correlacion Anatomoclinica en pacientes operados con Trabeculectomia y su estabilidad funcional
Foreign language
• "Perez-Candelaria, Eneida de la C, Coba Pena, Maria Josefa, Vigoa Aranguren, Lazaro, and Capote Cabrera, Armando. Correlacion Anatomoclinica en pacientes operados con Trabeculectomia y su estabilidad funcional
Foreign language
It is a case series
• "Petounis, A., Mylopoulos, N., Kandarakis, A., Andreanos, D., and Dimitrakoulis, N. Comparison of the additive intraocular pressure-lowering effect of latanoprost and dorzolamide when added to timolol in patients with open-angle glaucoma or ocular hypertension: a randomized, open-label, multicenter study in Greece
Medical KQ 3 or KQ 3 and KQ 6 only
• "Pfeiffer, N. A comparison of the fixed combination of latanoprost and timolol with its individual components
Medical KQ 3 or KQ 3 and KQ 6 only
• "Pfeiffer, N. and German Latanopost Fixed Combination Study Group. A COMPARISON OF THE FIXED COMBINATION OF LATANOPROST AND TIMOLOL WITH IST INDIVIDUAL COMPONENTS IN PATIENTS WITH GLAUCOMA OR OCULAR HYPERTENSION Meeting abstract
Other (specify): no rct. no harms"
• "Pfeiffer, N. and Grehn, F. [Treatment of glaucoma chronicum simplex with a combination of 0.5 percent timolol with 0.5 percent adrenaline plus 0.3 percent guanethidine]. Klin Monbl Augenheilkd 89 ;194 (3): 161-3 .
Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Pfeiffer, N., Grehn, F., Hennekes, R., and Garus, H. [Decrease in intraocular pressure following administration of the local carbonic anhydrase inhibitor (MK-927)--comparison of the effect with pilocarpine]. Fortschr Ophthalmol 90 ;87 (2): 128-30 .
Does not include treatment for open-angle glaucoma (medical, surgical or combined)
Does not include treatment for open-angle glaucoma (medical, surgical or combined)

- Does not address any key questions
- Other (specify): not FDA approved. It is not a RCT and has less than 100 patients"
- "Pfeiffer, N., Yannoulis, N., Mertz, B., Cirkel, C., Kapik, B., and The Unoprostone Study Group. Efficacy and safety of unoprostone isopropyl 0.15% and latanoprost 0.005% in adjunctive therapy to timolol maleate 0.5% in patients with primary open-angle glaucoma or ocular hypertension

Meeting abstract

- It is a case series
- Other (specify): applies to KQ3 but not RCT"
- "Picht, G., Mutsch, Y., and Grehn, F. [Follow-up of trabeculectomy. Complications and therapeutic consequences]

Foreign language

- It is a case series
- "Pillunat, L. E, Kamman, J., and Kohlhaas, M. Clear cornea phacoemulsification as an intraocular pressure lowering procedure in glaucoma

Meeting abstract

- "Pillunat, L. E. and Larsson, L. I. Intraocular pressure after replacement of current dual therapy with latanoprost monotherapy in patients with open angle glaucoma

Medical KQ 3 or KQ 3 and KQ 6 only

- "Piltz, J. R. and Bose, S. EFFECT OF â1-SELECTIVE AND NON-SELECTIVE â-BLOCKERS ON MACULAR BLOOD FLOW AND CONTRAST SENSITIVITY

Meeting abstract


Foreign language

- "Pinella, P. J., Lala, E., Parier, V., Brignole, F., and Baudouin, C. [Effect of preservatives on the conjunctiva: a comparative study of beta-blocker eye drops with and without preservatives in glaucoma patients]

Foreign language

- "Pitrova, S. and Kalvodova, B. [General symptoms following administration of isopto-carbachol]

Foreign language

- It is not a RCT and has less than 100 patients
- "Plane, C., Sansorgne, R., Renaud, C., and Jouan, J. P. [2-year long-term treatment of chronic glaucoma with timolol eyedrops]

Foreign language

- "Plane, C., Sole, P., and Hamard, H. Results of a double blind study comparing timolol and pilocarpine in 110 patients with chronic open-angle glaucoma: RESULTATS D'UNE ETUDE EN DOUBLE OBSERVATEUR COMPARANT LE TIMOLOL A LA PILOCARpine CHEZ 110 PATIENTS ATTEINTS DE GLAUCOME CHRONIQUE A ANGLE OUVERT

Foreign language

- "Plane, C., Sole, P., Hamard, H., Vidal, R., Ourgaud, A. G., and Chagnon, A. [Results of a double-blind study comparing the effects of timolol and pilocarpine in 110 patients with chronic open-angle glaucoma]"
• "Plange, N., Harris, A., Wolter, K., Remky, A., and Arend, O. Retinal hemodynamics, perimetry and contrast sensitivity in glaucoma therapy
  Meeting abstract
• "Pliushko, D. G. [Drug treatment of the initial stage of glaucoma]
  Foreign language
• "Pliushko, D. G. and Kornienko, V. V. [Late results of trabeculectomy in open-angle glaucoma]
  Foreign language
• "Pliushko, D. G. and Sobko, E. G. [Drug therapy of initial open-angle glaucoma]
  Foreign language
  Foreign language
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Does not address any key questions
• "Polo, V., Larrosa, J. M., Ferreras, A., and Honrubia, F. M. Latanoprost vs combined therapy with timolol plus dorzolamide in open-angle glaucoma: A 24-month study
  Medical KQ 3 or KQ 3 and KQ 6 only-no true 24hours
• "Polo, V., Larrosa, J. M., Ferreras, A., Borque, E., Pablo, L. E., and Honrubia, F. M. Effect on diurnal intraocular pressure of the fixed combination of latanoprost 0.005% and timolol 0.5% administered in the evening in glaucoma. Ann Ophthalmol (Skokie) 2008 ;40 (3-4): 157-62 .
  Other (specify):No control group
• "Polo, V., Larrosa, J. M., Gomez, M. L., Pablo, L., and Honrubia, F. M. Latanoprost versus combined therapy with timolol plus dorzolamide: IOP-lowering effect in open-angle glaucoma
  Medical KQ 3 or KQ 3 and KQ 6 only
• "Popa, D. P., Vasinca, D., Mihalachi, C., Mandroiu, S., and Diminescu, M. [The efficacy of Cairns trabeculectomy in open-angle glaucoma]
  Foreign language
• "Popiela, G., Muzyka, M., Szelepin, L., Cwirko, M., and Nizankowska, M. H. [Use of YAG-Selecta laser and argon laser in the treatment of open angle glaucoma]
  Foreign language
• "Potocky, M. [The Slovak study of the travoprost treatment efficacy]
  Foreign language
• "Potocky, M. and Vodrazkova, E. [Beta-blockers in the treatment of open-angle glaucoma]
  Foreign language
• "Potocky, M. and Vodrazkova, E. Betablockers in the treatment of primary open-angle glaucoma
  Duplicate"
• "Potocky, M. The Slovak study of the travoprost treatment efficacy: Slovenska studia efektivity liecyh travoprostom
  Duplicate 1546"
  It is a case series
  It is not a RCT and has less than 100 patients
  It is not a RCT and has less than 100 patients

- **It is not a RCT and has less than 100 patients**
- "Prata Junior, João Antonio and Reyes, Jose Carlos. Uso prolongado de col/Érios antiglaucomatosos e eficácia da trabeculectomia.

**Foreign language**


- **It is not a RCT and has less than 100 patients**

**OAG can't be analyzed separately**


**Systematic review**


- **It is a case series**
- "Preoteasa, D. and Mocanu, C. [Efficacy of ophthalmic suspension of Brinzolamide (Azopt) in the primary or combined therapy for patients with hypertensive glaucomas].

**Foreign language**

- "Pribylova, E. Thromboses of retinal veins.

**Foreign language**


- **No subjects with open-angle glaucoma**
- "Promesberger, H. and Junemann, G. [Results of treatment with timolol in problematic cases (author's transl)]. Klin Monbl Augenheilkd 81 ;179 (6): 426-7.

- **It is not a RCT and has less than 100 patients**

- **It is combined cataract/glaucoma surgery study published before April 2000**
- "Prost, M. and Krwawicz, L. [Timolol in the treatment of uncontrolled glaucoma (author's transl)]

**Foreign language**


**OAG can’t be analyzed separately**


- **It is a case series**

**Does not include treatment for open-angle glaucoma (medical, surgical or combined)**


**Other (specify): pilocarpine**


- **It is not a RCT and has less than 100 patients**
- "Puustjarvi, T., Aine, E., and Hakala, T. The effect of two timolol and pilocarpine combinations versus timolol 0.5% in the treatment of open-angle glaucoma.

**Unique comparators**

- "Puy, P., Arias-Quintana, A., Shafik, M., gomez, M., Kamel, N., Benitez del Castillo, J., and Garcia-Sanchez, J. EFFECT OF PILOCARPINE AND DIPIVALYL-EPINEPHRINE ON THE BLOOD AQUEOUS BARRIER IN GLAUCOMATOUS PATIENTS.

**Meeting abstract**
• "Qu, J. M., Tang, G. L., and Hou, J. P. [Comparison of two ways for adjustable suture in complex trabeculectomy]

Foreign language

Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Quaranta, L., Miglior, S., Floriani, I., Pizzolante, T., and Konstas, A. G. Effects of the timolol-dorzolamide fixed combination and latanoprost on circadian diastolic ocular perfusion pressure in glaucoma

Medical KQ 3 or KQ 3 and KQ 6 only

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

It is a case series

Data not abstractable

No original data (e.g., systematic review, narrative review, editorial, letter)

Other (specify)ocusert no longer sold"

It is a case series
• "Quiralte, J., Florido, F., and de San Pedro, B. S. Allergic contact dermatitis from carteolol and timolol in eyedrops. Contact Dermatitis 2000;42(4):245.

It is a case series

It is a case series

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

It is a case series

It is a case series

Does not address any key questions


Does not address any key questions

"Radian, A. B. and Alupei, L. [Clinical observations on the local use of timolol maleate] Foreign language


"Radian, A. B., Chereches, S., and Alupei, L. [A comparative study of the ocular hypotonic action of collyria with oxprenolol and timolol maleate] Foreign language


It is not a RCT and has less than 100 patients


Other (specify): Not a comparison of interest


It is not a RCT and has less than 100 patients


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is a case series


It is not a RCT and has less than 100 patients


"Ramdas, W. D., van der Velde, N., van der Cammen, T. J., and Wolfs, R. C. Evaluation of risk of falls and orthostatic hypotension in longer-term topical beta-blocker users Unique comparators

"Rao, H. L., Babu, G. J., and Sekhar, G. C. Comparison of the diagnostic capability of the Heidelberg Retina Tomographs 2 and 3 for glaucoma in the Indian population Systematic review


It is not a RCT and has less than 100 patients


It is not a RCT and has less than 100 patients

Data not abstractable

OAG can't be analyzed separately
• "Rayner, S. A., Bhikoo, R., and Gray, T. Spherical implantable collamer lenses for myopia and hyperopia: 126 eyes with 1-year follow up

Systematic review

No original data (e.g., systematic review, narrative review, editorial, letter)
• "Razemon, P., Dascotte, J. C., and Leser, C. [Our experience with the tonometric effect of timolol]

Foreign language

No original data (e.g., systematic review, narrative review, editorial, letter)

No original data (e.g., systematic review, narrative review, editorial, letter)

Does not address any key questions

Other (specify): Prednisolone not a medication of interest, Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study"

• "Reardon, G., Schwartz, G. F., and Kotak, S. Persistence on prostaglandin ocular hypotensive therapy: an assessment using medication possession and days covered on therapy

Systematic review

OAG can't be analyzed separately

Does not address any key questions

Animal or in vitro data

Other (specify): No control

Does not address any key questions
• "Rehman, S. U., Amoaku, W. M. K, Doran, R. M. L, Menage, M. J, Morrell, A. J, and Fox, P. D. Investigation into the Use of Beta Radiation as an Adjunct to Trabeculectomy in Glaucoma

Meeting abstract
• "Rehman, S. U, Tesha, P., Merriman, M., Amoaku, W. M K, Barnes, R., Menage, M. J, and Mora, J. Results of A Multi-Centered Randomized Controlled Trial of Beta Irradiation as an Adjunct to Trabeculectomy in Open-Angle Glaucoma

Meeting abstract
• "Rehman, S. U., Amoaku, W. M., Doran, R. M., Menage, M. J., and Morrell, A. J. Randomized controlled clinical trial of beta irradiation as an adjunct to trabeculectomy in open-angle glaucoma

Kirwan 2009

It is not a RCT and has less than 100 patients


Does not address any key questions


It is not a RCT and has less than 100 patients

• "Reichstein, D., Kammer, J., and Recchia, F. Combined 25-gauge vitrectomy and posterior tube shunt placement for advanced glaucoma Systematic review


OAG can’t be analyzed separately


Does not address any key questions

• "Reis, R., Queiroz, C. F., Santos, L. C., Avila, M. P., and Magacho, L. A randomized, investigator-masked, 4-week study comparing timolol maleate 0.5%, brinzolamide 1%, and brimonidine tartrate 0.2% as adjunctive therapies to travoprost 0.004% in adults with primary open-angle glaucoma or ocular hypertension Medical KQ 3 or KQ 3 and KQ 6 only

• "Reiter, C., Wimmer, S., Schultheiss, A., Klink, T., Grehn, F., and Geerling, G. [Corneal epitheliopathy following trabeculectomy with postoperative adjunctive 5-fluorouracil] Foreign language


It is not a RCT and has less than 100 patients


It is a case series


Other (specify): study design does not match KQ (3)

• "Remky, H. [Extended sinusectomy (trabeculectomy with cyclodialysis effect). Late results and analysis of failures]. Klin Monbl Augenheilkd 86 ;188 (4): 278-82.

Data not abstractable


It is combined cataract/glaucoma surgery study published before April 2000

• "Ren, J., Tinoosh, F., Chung, H. S., Birt, C. M, and Glover, B. Efficacy of Apraclonidine 1% vs. Pilocarpine 4% for Prophylaxis of Intraocular Pressure Spike after Argon Laser Trabeculoplasty Meeting abstract


• "Renard, G., Valtot, F., Giraud, J. P., and Offret, G. [Is it possible to use 0.1% timolol in the treatment of chronic glaucoma?] Foreign language

• "Renieri, G., Fuhrer, K., Scheithe, K., Lorenz, K., Pfeiffer, N., and Thieme, H. Efficacy and tolerability of preservative-free eye drops

It is a case series


It is a case series


It is a case series

- "Reyna, M nica and Consigli, Carlos A. Blefaroconjuntivitis de contacto alergica por timolol Foreign language

- "Rhee, D. J., Peace, J. H., Mallick, S., Landry, T. A., and Bergamini, M. V. A study of the safety and efficacy of travoprost 0.004%/timolol 0.5% ophthalmic solution compared to latanoprost 0.005% and timolol 0.5% dosed concomitantly in patients with open-angle glaucoma or ocular hypertension. Clin Ophthalmol 2008;2 (2): 313-319.

Does not address any key questions

- "Ribeiro, Breno Barreto, Roitberg, Marcelo, Marigo, Fltbvio, Cronemberger, SebastiPo, and Torqueti, Leonardo. Estudo do £stio interno da trabeculectomia pela biomicroscopia ultra-sônica Foreign language


It is a case series


It is not a RCT and has less than 100 patients


It is a case series


Data not abstractable

- "Rismanchian, A., Eslami, F., Moeini, H., Attarzade, H., and Naderiben, A. Efficacy of the latanoprost versus timolol/dorzolamide combination therapy in patients with primary open angle glaucoma Medical KQ 3 only


No original data (e.g., systematic review, narrative review, editorial, letter)


Does not address any key questions


- "Rivero Reyes, Reinaldo L, Rio Torres, Marcelino, and L£pez Pardo, Cbrndido M. Acci£n sobre la hidroconductancia del humor acuoso de medicamentos de acci£n hipotensora Foreign language

- "Robin, A. DECREASING THE FREQUENCY OF POSTOPERATIVE IOP RISE ASSOCIATED WITH COMBINED CATARACT EXTRACTION AND TRABECEULECTOMY WITH TOPICAL APRACLOLINIDINE 1 % Meeting abstract

- "Robin, A. L, Krishnadas, R., Sathyan, P., and Ramakrishnan, R. A comparison of the additive effects of betaxolol 0.25% suspension and timolol maleate 0.5% when added to latanoprost 0.005% in patients with bilateral openangle glaucoma Meeting abstract

- "Robin, A. L, Protzko, E. E, Visco, D. M, LaBorwit, S. E, Smearman, S. M, Khanna, S., Seidenberg, J. A, Reed, D., Stottlemyer, J., and Brummett,
M. Four-Week Double-Masked Comparison of Adverse Events Associated with Travoprost and Bimatoprost in Ocular Hypertension and Glaucoma

Meeting abstract

No original data (e.g., systematic review, narrative review, editorial, letter)

No original data (e.g., systematic review, narrative review, editorial, letter)
- "Robin, A. L. Apraclonidine Reduces Intraocular Pressure Rises After Combined Extracapsular Cataract Surgery and Trabeculectomy Meeting abstract

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

It is not a RCT and has less than 100 patients

Data not abstractable

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

Other (specify): excluded drug

Other (specify): apraclonidine

Data not abstractable
- "Robison, M., Gamero, G., Harmon, H., Goldsmith, L., Fichtener, R., and Zimmerman, T. THE EFFECT OF NASOLACRIMAL OCCLUSION ON THE DURATION OF ACTION OF DORZOLAMIDE 2% Meeting abstract

Does not address any key questions
• "Rodriguez Bermejo, C., Montero, P., Perez Santonja, J. J., Meza, J., Gasco, J. L., and Zato Gomez De Liano, M. A. Comparative study of quimiotherapeutic agents as contribution in chronic simple glaucoma surgery Duplicate "

• "Rodriguez-Bermejo, C., Montero, P., Perez-Santonja, J. J., Meza, J., Gasco, J. L., and Zato GDLMA. Comparative study of quimiotherapeutic agents as contribution in chronic simple glaucoma surgery. ESTUDIO COMPARATIVO DE AGENTES QUIMIOTERAPICOS COMO COADYUVANTES A LA CIRUGIA DEL GLAUCOMA CRONICO SIMPLE Duplicate "

• "Rodriguez-Prats, J. L., Alio, J. L., and Galal, A. Milling trabeculoplasty for nonpenetrating glaucoma surgery. J Cataract Refract Surg 2004 ; 30 (7): 1507-16 . Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Rojanapongpun, P. Comparison of Separate-Site to Same-Site Approach in Combined Phaco-Trabeculectomy with Mitomycin-C Meeting abstract


• "Rolle, T., Tofani, F., Brogliatti, B., and Grignolo, F. M. The effects of dorzolamide 2% and dorzolamide/timolol fixed combination on retinal and optic nerve head blood flow in primary open-angle glaucoma patients Unique comparators

• "Rom, M., Schwartz, B., and Bealke, N. Enhanced acute ocular hypotensive response to timolol with dexamethasone treatment. J Glaucoma 97 ;6 (2): 111-6 . Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Romaguera, C., Grimalt, F., and Vilaplana, J. Contact dermatitis by timolol. Contact Dermatitis 86 ;14 (4): 248 . It is a case series

• "Romanova, T. B. and Abakumova, L. I. a. [Reaction of the pupil in patients with glaucoma following long-time treatment with pilocarpine] Foreign language

• "Ros, F. E., Dake, C. L., Innemee, H. C., and van Zwieten, P. A. [Beta-receptor blocking agents and glaucoma; timolol in eye drops]

Foreign language

• "Rosenberg, L. F., Krupin, T., Tang, L. Q., Hong, P. H., and Ruderman, J. M. Combination of systemic acetazolamide and topical dorzolamide in reducing intraocular pressure and aqueous humor formation. Ophthalmology 98 ;105 (1): 88-92; discussion 92-3 . It is not a RCT and has less than 100 patients

• "Rosenlund, E. F. The intraocular pressure lowering effect of timolol in gel-forming solution Medical KQ 3 or KQ 3 and KQ 6 only


• "Rosenthal, A., Walters, T., Berg, E., Safyan, E., and Batoosingh, A. A COMPARISON OF THE SAFETY AND EFFICACY OF BRIMONIDINE 0.2%, BID VERSUS TID, IN SUBJECTS WITH ELEVATED INTRAOCULAR PRESSURE Meeting abstract

• "Rosentretre, A., Mellein, A. C., Konen, W. W., and Dietlein, T. S. Capsule excision and Ologen(trademark) implantation for revision after glaucoma drainage device surgery Duplicate of 148 "

• "Ross, A. H., Jackson, T. E., Wertheim, M. S., Spry, P. G., Sparrow, J. M., and Diamond, J. P. Analysis of the diurnal intraocular pressure profile pre and post trabeculectomy using 24-hour monitoring of intraocular pressure. Eur J Ophthalmol 2010 ; It is not a RCT and has less than 100 patients


It is combined cataract/glaucoma surgery study published before April 2000
Other (specify):not FDA approved combination"
• "Rossi, G. C., Pasinetti, G. M., Bracchino, M., Bucarelli, M., Franchin, S., Cerqueti, P., Bellini, R., Caravati, C., Celesia, L., Clemente, A., and Tinelli, C. Switching from concomitant latanoprost 0.005% and timolol 0.5% to a fixed combination of travoprost 0.004%/timolol 0.5% in patients with primary open-angle glaucoma and ocular hypertension: a 6-month, multicenter, cohort study. Expert Opin Pharmacother 2009 ;(11): 1705-11
Other (specify):No concurrent control"
It is combined cataract/glaucoma surgery study published before April 2000
• "Rotchford, A. P. and King, A. J. Moving the goal posts definitions of success after glaucoma surgery and their effect on reported outcome Systematic review
• "Rotchford, A. P. and Murphy, K. M. Compliance with timolol treatment in glaucoma. Eye (Lond) 98 ;12 ( Pt 2) : 234-6 .
Does not address any key questions
It is not a RCT and has less than 100 patients
Does not include treatment for open-angle glaucoma (medical, surgical or combined)
It is not a RCT and has less than 100 patients
Other (specify):Not a comparison of interest
It is not a RCT and has less than 100 patients
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
It is a case series
Does not address any key questions
• "Rouland, J. F., Morel-Mandrino, P., Elena, P. P., Polzer, H., and Sunder Raj, P. Timolol 0.1% gel (Nyogel 0.1% (registered trademark)) once daily versus conventional timolol 0.5% solution twice daily: a comparison of efficacy and safety
Medical KQ 3 or KQ 3 and KQ 6 only
Foreign language
• "Rouland, J.-F., Morel-Mandrino, P., Elena, P.-P., Polzer, H., and Sunder Raj, P. Timolol 0.1% gel (nyogel 0.1% (registered trademark)) once daily
versus conventional timolol 0.5% solution twice daily: A comparison of efficacy and safety

**Medical KQ 3 or KQ 3 and KQ 6 only**

- "Rouxel, A. M., Roguedas-Contios, A. M., and Misery, L. [Malar and ciliary hypertrichosis induced by bimatoprost]
  **Foreign language**

  **It is a case series**

- "Royer, J., Roth, A., and Montard, M. [Results of our experience with the use of timolol maleate eyedrops]
  **Foreign language**

- "Rozovskaya, S. B. [Problems of drug therapy of initial glaucoma and the atypical reaction to pilocarpine]
  **Foreign language**

- "Ruiz Mesa, R., Benitez Del Castillo Sanchez, J., Jimenez-Alfaro Morote, I., and Benitez Del Castillo, J. M. Mitomycin-C in primary normal glaucomas surgery: La mitomicina-C en la cirugia de los glaucomas primarios normales
  **Foreign language**

  78 (12): 899-902 .
  **Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

  **Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

  **Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

- "Rulo, A., Greve, E., Hoyng, P., and Alm, A. A STUDY OF THE E1+hCT OF LATANOPROST ON THE INTRAOCULAR PRESSURE AND RETINAL VASCULATURE IN PSEUDOPHAKIC PATIENTS
  **Meeting abstract**

- "Rusk, C., Laurence, J., Polis, A., and Adamsons, I. COMPARISON OF THE EFFICACY AND SAFETY OF DORZOLAMIDE ARID BETAXOLOL
  **Meeting abstract**

- "Rusk, C., Liss, R., Clineschmidt, C., Getson, A., Shedden, A., and Adamsons, I. Comparison of the Efficacy and Safety of Preservative-Free Dorzolamide and Dorzolamide with Preservative
  **Meeting abstract**

- "Rusk, C., Sharpe, E., Laurence, J., Polis, A., and Adamsons, I. Comparison of the efficacy and safety of 2% dorzolamide and 0.5% betaxolol in the treatment of elevated intraocular pressure
  **Medical KQ 3 or KQ 3 and KQ 6 only**

- "Rusk, C., Sharpe, E., Laurence, J., Polis, A., and Adamsons, I. Comparison of the efficacy and safety of 2% dorzolamide and 0.5% betaxolol in the treatment of elevated intraocular pressure. Dorzolamide Comparison Study Group
  **Medical KQ 3 or KQ 3 and KQ 6 only**

- "Rusk, C., Snyder, E., and Adamsons, I. A CLINICAL TRIAL COMPARING PATIENT PREFERENCE AND IMPACT ON DAILY LIFE OF THE DORZOLAMIDE/TIMOLOL COMBINATION TO PILOCARPINE PLUS TIMOLOL
  **Meeting abstract**

  **It is a case series**

  **Does not address any key questions**

  **Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

  **Does not address any key questions**

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Sahouri, M., Shin, D., Hughes, B., and Kim, C. COMPARATIVE STUDY OF PMMA VS SILICONE IOL THROUGH SMALL INCISION IN GLAUCOMA TRIPLE PROCEDURE
Meeting abstract

Does not include treatment for open-angle glaucoma (medical, surgical or combined)
• "Saito, Y., Higashide, T., Takeda, H., Ohkubo, S., and Sugiyama, K. Beneficial effects of preoperative intravitreal bevacizumab on trabeculectomy outcomes in neovascular glaucoma
Systematic review
• "Sakai, T. and Yamashita, S. [Choroidal detachment after glaucoma surgery]
Foreign language
• "Salach, L., Uher, M., and Ogielska, E. [Timoptic in the treatment of glaucoma]
Foreign language
• "Sall, K. N, Johnson-Pratt, L., Skobieranda, F., Polis, A., DeLuca, P., Kolodny, A., Fletcher, C., and Cassel, D. A comparison of the ocular hypotensive effect of dorzolamide hydrochloride/ timolol maleate to that of the concomitant therapy with brimonidine tartate and timolol maleate in patients with ocular hypertension or primary open-angle glaucoma
Meeting abstract
Medical KQ 3 or KQ 3 and KQ 6 only
• "Sall, K. The efficacy and safety of brinzolamide 1% ophthalmic suspension (Azopt((registered trademark))) as a primary therapy in patients with open-angle glaucoma or ocular hypertension
Medical KQ 3 or KQ 3 and KQ 6 only
• "Sall, K. The efficacy and safety of brinzolamide 1% ophthalmic suspension (Azopt) as a primary therapy in patients with open-angle glaucoma or ocular hypertension. Brinzolamide Primary Therapy Study Group
Medical KQ 3 or KQ 3 and KQ 6 only
Medical KQ 3 or KQ 3 and KQ 6 only
• "Samuels, S. I. and Maze, M. Beta-receptor blockade following the use of eye drops. Anesthesiology  80 ;52 (4): 369-70 .

It is a case series
• "Samuelson, T. W. and Simmons, S. T. Efficacy and tolerability of Alphagan versus Xalatan as adjunct therapy in chronic open-angle glaucoma or ocular hypertension patients uncontrolled on beta-blockers alone
Meeting abstract
• "Sanchez, E., Schnyder, C. C., and Mermoud, A. [Comparative results of deep sclerectomy transformed to trabeculectomy and classical trabeculectomy]
Foreign language

OAG can’t be analyzed separately
• "Sanchez, J. G. Efficacy and side effects of latanoprost monotherapy compared to adding dorzolamide to timolol in patients with glaucoma and ocular hypertension - A three-month randomised study
Duplicate "
• “Sanders, S. and Chaudhuri, R. INITIAL SUCCESS OF COMBINED CATARACT SURGERY AND ENDOCYCLOPHOTOCAOUGULATION IN REDUCING THE NEED FOR TOPICAL THERAPY IN GLAUCOMA
Meeting abstract

• "Sanders, S. P., Cantor, L. B., and Hoop, J. S. MITOMYCIN C IN PRIMARY TRABECULECTOMY: A COMPARISON OF 0.1 TO 0.2 MG/CC
Meeting abstract

• "Sanders, S. P., Cantor, L. B., Dobler, A. A., and Hoop, J. S. Mitomycin C in higher risk trabeculectomy: a prospective comparison of 0.2- to 0.4-mg/cc doses
Unique comparators

• "Sanders, S. P., Cantor, L. B., Dobler, A. A., Hoop, J., Sponsel, W. E., and Shoemaker, J. MITOMYCIN C IN COMPLICATED TRABECULECTOMY: A COMPARISON OF 0.2 TO 0.4 MG/CC
Meeting abstract

• "Sanfelici, G., Rolando, M., Calabria, G., and Murialdo, U. [Timolol and dapiprazole combination in patients with glaucoma]
Foreign language

• "Santos, H. D., Fernandes, T. A., Souza, C. A., Cronemberger, S., and Calixto, N. [Efficacy of latanoprost versus travoprost assessed by daily intraocular pressure curve]
Foreign language

• "Santos, Hérica Danielle de Miranda, Fernandes, Thativana Almeida Pereira, Souza, Camila Ara jo de, Cronemberger, SebastiPo, and Calixto, Nassim. Eficácia do latanoprost versus travoprost assessed by daily intraocular pressure curve [Efficacy of latanoprost versus travoprost assessed by daily intraocular pressure curve]
Foreign language


Does not include treatment for open-angle glaucoma (medica, surgical or combined)

• "Savelsbergh-Fillette, M. P. and Demailly, P. [Comparative study of levobunolol and timolol in the treatment of chronic open-angle glaucoma and chronic ocular hypertension]
Foreign language

• "Scafidi, A. F., Stewart, W. C., Ropo, A. M., and the Timolol Hemihydrate Study Group. SAFETY AND EFFICACY OF TIMOLOL HEMIHYDRATE (0.25 AND 0.5% OPHTHALMIC SOLUTION) IN OPEN-ANGLE GLAUCOMA AND OCULAR HYPERTENSION
Meeting abstract

It is not a RCT and has less than 100 patients

"Schiffer, H. P. [Comparative study between timolol and pilocarpine in the treatment of open-angle glaucoma (author's transl)]

Foreign language


Duplicate"

"Schiffman, R. M and Javitt, J. C. The Clinical Success Rate and Quality of Life of Brimonidine 0.2% BID vs. Timolol 0.5% BID, in Previously Untreated OAG or OHT Patients

Meeting abstract

"Schild, A. M., Jordan, J. F., Konen, W., Krieglstein, G. K., and Dietlein, T. S. Midterm patient satisfaction following mitomycin C-assisted trabeculectomy: Patientenzufriedenheit nachiltrierender glaukomchirurgie mit mitomycin C

Foreign language


(4): 294-301.

OAG can’t be analyzed separately


It is a case series, Does not address any key questions

"Schmidt, C. M Jr, Wilson, R. P., Steinmann, W. C., and Spaeth, G. L. SUTURE TYPE AFFECTS TENON'S CYST INCIDENCE IN LIMBAL-BASED TRABECULECTOMY

Meeting abstract


Meeting abstract


Data not abstractable


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not address any key questions


Systematic review

"Schmitz-Valckenberg, P. and Kessler, C. LOW-DOSE COMBINATION OR HIGH-DOSE SEPARATE SOLUTIONS IN GLAUCOMA?

Meeting abstract


It is a case series

"Schmier, K. D. [Comparative multicenter study of carteolol eyedrops with other beta blockers in 768 patients under normal conditions]

Foreign language

"Schnyder, C. C., Bernasconi, O., Mermoud, A., and Faggioni, R. [Comparative study of administration time of mitomycin C in trabeculectomy: 2.5 or 5 minutes?]

Foreign language


245 (14): 1460-1.

No subjects with open-angle glaucoma

"Schröms, W., Hofmann, G., and Krieglstein, G. K. [Therapy of open-angle glaucoma with the argon and neodymium laser]. Fortschritte der
Other (specify): no rct and no harms


No original data (e.g., systematic review, narrative review, editorial, letter)

- Schuhr, J., Stewart, J. A., Day, D. G., Leech, J. N., and Stewart, W. C. The Safety and Efficacy of Unoprostone Isopropyl 0.15% Versus Brimonidine 0.2%
  Meeting abstract

It is a case series


It is a case series

- Schulzer, M. Intraocular pressure reduction in normal-tension glaucoma patients
  Duplicate of 5281
- Schulzer, M. Intraocular pressure reduction in normal-tension glaucoma patients. The Normal Tension Glaucoma Study Group
  Maier 2005 and Burr 2004
- Schulzer, M., Drance, S. M, and Anderson, D. R. Successful Intraocular Pressure Reduction in Normal Tension Glaucoma
  Meeting abstract
  Maier, 2005
- "Schuman, J. S., Pettigrew, S. C, Mallick, S., Wells, D. T, Andrew, R. M, Sullivan, E. K., Landry, T. A, Bergamini, M. V W, Robertson, S. M, and Travoprost 0.004%/Timolol 0.5% Study Group. A Comparison of Travoprost 0.004%/Timolol 0.5% Ophthamlic Solution to the Concomitant Administration of Travoprost 0.004% and Timolol 0.5% Ophthamlic Solutions and to Timolol 0.5% Ophthamlic Solution Alone
  Meeting abstract
- "Schuman, J. S. and AGN 192024 Study Groups, I. & II. 6-MONTH COMPARISON OF AGN 192024 QD AND BID WITH TIMOLOL BID IN PATIENTS WITH ELEVATED IOP
  Meeting abstract
  Does not include treatment for open-angle glaucoma (medical, surgical or combined)
- "Schuman, J. S. Effects of systemic beta-blocker therapy on the efficacy and safety of topical brimonidine and timolol. Brimonidine Study Groups 1 and 2

Excluded drug


It is a case series


Medical KQ 3 or KQ 3 and KQ 6 only

- "Schuman, J. S., Katz, G. J., Lewis, R. A., Henry, J. C., Mallick, S., Wells, D. T., Sullivan, E. K., Landry, T. A., Bergamini, M. V., and Robertson, S. M. Efficacy and safety of a fixed combination of travoprost 0.004%/timolol 0.5% ophthamlic solution once daily for open-angle glaucoma or ocular hypertension
  Non-FDA-approved drug combination
- "Schuman, J. S., Mallick, S., Wells, D. T., Sullivan, E. K., Landry, T. A., and Robertson, S. M. A Comparison of Travoprost 0.004%/Timolol 0.5% Ophthalmic Solution to the Concomitant Administration of Travoprost 0.004% and Timolol 0.5% Ophthalmic Solutions
  Meeting abstract
- "Schuman, J. S., Mallick, S., Wells, D. T., Sullivan, E. K., Landry, T. A., Bergamini, M. V. W., Wax, M. B., and Robertson, S. M. Evaluation of Travoprost 0.004%/Timolol 0.5% Fixed Combination Ophthalmic Solution vs. Concomitant Use of Travoprost 0.004% and Timolol 0.5%
  Meeting abstract

No original data (e.g., systematic review, narrative review, editorial, letter)
Does not include treatment for open-angle glaucoma (medical, surgical or combined)
Data not abstractable
Does not address any key questions
• "Schwartz, B., Takamoto, T., Lavin, P., and Smits, G. Increase of retinal nerve fiber layer thickness in ocular hypertensives with timolol therapy Vass 2007 
Other (specify):abstract"
No original data (e.g., systematic review, narrative review, editorial, letter)
No original data (e.g., systematic review, narrative review, editorial, letter)
Does not address any key questions
Does not address any key questions
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
It is a case series
It is not a RCT and has less than 100 patients
Does not address any key questions
Does not address any key questions
OAG can’t be analyzed separately
5-Fluorouracil vs Placebo—Effect on Long-Term Pressure Control and Glaucoma Progression

Meeting abstract

- "Seamone, C., LeBlanc, R., Saheb, N., and Novack, G. Efficacy of twice-daily levobunolol in the treatment of elevated intraocular pressure. Medical KQ 3 or KQ 3 and KQ 6 only
- "Sebastiani, A., Parmeggiani, F., Costagliola, C., Ciancaglini, M., D’Oronzo, E., and Mastropasqua, L. Effects of acute topical administration of clonidine 0.125%, apraclonidine 1.0% and brimonidine 0.2% on visual field parameters and ocular perfusion pressure in patients with primary open-angle glaucoma. Acta Ophthalmol Scand Suppl 2002;236:29-30. Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
- "Sehi, M., Grewal, D. S., Feuer, W. J., and Greenfield, D. S. The impact of intraocular pressure reduction on retinal ganglion cell function measured using pattern electroretinogram in eyes receiving latanoprost 0.005% versus placebo. Medical KQ 3 only
- "Sehi, M., Grewal, D. S., Goodkin, M. L., and Greenfield, D. S. Reversal of Retinal Ganglion Cell Dysfunction after Surgical Reduction of Intraocular Pressure. Ophthalmology 2010; It is not a RCT and has less than 100 patients
- "Seider, N., Miller, B., and Beiran, I. Topical glaucoma therapy as a risk factor for nasolacrimal duct obstruction. Unique comparators
- "Serle, J. B. A comparison of the safety and efficacy of twice daily brimonidine 0.2% versus betaxolol 0.25% in subjects with elevated intraocular pressure. Medical KQ 3 or KQ 3 and KQ 6 only
- "Serle, J. B. A comparison of the safety and efficacy of twice daily brimonidine 0.2% versus betaxolol 0.25% in subjects with elevated intraocular pressure. The Brimonidine Study Group II. Medical KQ 3 or KQ 3 and KQ 6 only
- "Serle, J. B., Lustgarten, J. S., and Podos, S. M. A clinical trial of metipranolol, a noncardioselective beta-adrenergic antagonist, in ocular hypertension. Medical KQ 3 or KQ 3 and KQ 6 only
- "Serle, J. B., Piltz, J. R., Rosenberg, L. F., Wright, M., and Gagliuso, D. J. COMPARISON OF EFFICACY & TOLERABILITY OF 0.5% APRACLONIDINE T.I.D. AND 0.2% BRIMONIDINE B.I.D. IN PATIENTS WITH ELEVATED INTRAOCULAR PRESSURE (IOP). Meeting abstract
INTRAOCULAR PRESSURE LOWERING EFFECT OF COSOPT® TO THE CONCOMITANT ADMINISTRATION OF ALPHAGAN® AND TIMOLOL

Meeting abstract

It is a case series

OAG can’t be analyzed separately

Other (specify):Study design does not match KQ

It is a case series

It is not a RCT and has less than 100 patients

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

It is a case series

It is combined cataract/glaucoma surgery study published before April 2000
• “Shao, H., Sun, X. Y., and Bai, F. G. [Comparison of 0.1% dipivalyl epinephrine and 1% epinephrine in patients with glaucoma or ocular hypertension]

Foreign language

No original data (e.g., systematic review, narrative review, editorial, letter)

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

Data not abstractable

Data not abstractable

Medical KQ 3 or KQ 3 and KQ 6 only

Meeting abstract
• “Sharpe, E. D, Kapik, B., Reaves, A., Haque, R., and Shams, N. Comparison of the effect of different concentrations of the cocomainoid...
unoprostone isopropyl on intraocular pressure in patients with primary open-angle glaucoma or ocular hypertension

Meeting abstract
- "Sharpe, E. D., Day, D. G., Beischel, C. J., Rhodes, J. S., Stewart, J. A., and Stewart, W. C. Brimonidine purite 0.15% versus dorzolamide 2% each given twice daily to induce intraocular pressure in subjects with open angle glaucoma or ocular hypertension. Medical KQ 3 or KQ 3 and KQ 6 only
- "Sharpe, E. D., Henry, C. J., Mundorf, T. K., Day, D. G., Stewart, J. A., Jenkins, J. N., and Stewart, W. C. Brimonidine 0.2% vs unoprostone 0.15% both added to timolol maleate 0.5% given twice daily to patients with primary open-angle glaucoma or ocular hypertension. Eye (Lond) 2005 ;19 (1): 35-40.
- Other (specify): Unoprostone
- OAG can’t be analyzed separately
- Other (specify): Verapamil not a medication of interest
- "Sherwood, M. B., Lattimer, J., and Hitchings, R. A. Laser trabeculoplasty as supplementary treatment for primary open angle glaucoma. Rollim de Moura 2009
- "Sherwood, M. for the Brimonidine Study Group. A Comparison of the Safety and Ocular Hypotensive Efficacy of Twice Daily Brimonidine 0.2% versus Betaxolol 0.25% Suspension in Patients with Open-Angle Glaucoma or Ocular Hypertension. Meeting abstract
- OAG can’t be analyzed separately
- "Shedden, A., Laurence, J., and Tipping, R. Efficacy and tolerability of timolol maleate ophthalmic gel-forming solution versus timolol ophthalmic solution in adults with open-angle glaucoma or ocular hypertension: a six-month, double-masked, multicenter study. Medical KQ 3 or KQ 3 and KQ 6 only
- No subjects with open-angle glaucoma
- "Shen, Z. M. [Preliminary report of clinical observation on reduction in intraocular pressure by timolol (author's transl)]
- Foreign language
- "Sherwood, M. and Brandt, J. Six-month comparison of bimatoprost once-daily and twice-daily with timolol twice-daily in patients with elevated intraocular pressure. Medical KQ 3 only
- OAG can’t be analyzed separately
- OAG can’t be analyzed separately
- Other (specify): Timolol vs timolol
- Data not abstractable

Data not abstractable

• "Shiew, M. M. F. and O'Brart, D. P. S. Comparison of Trabeculectomy with Viscocanulostomy with Adjunctive Anti-metabolite Usage: A Randomised, Prospective Study

Meeting abstract


It is a case series


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• "Shin, D. H. THE EFFICACY AND SAFETY OF BRINZOLAMIDE AS PRIMARY THERAPY FOR OPEN-ANGLE GLAUCOMA AND OCULAR HYPERTENSION

Meeting abstract


Non-FDA-approved drug combination


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

• "Shin, D. H., Garadi, R., and The Timolol Gel Forming Solution 0.5% Study Group. THE IOP-LOWERING EQUIVALENCE OF TIMOLOL MALEATE 0.5% GEL FORMING SOLUTION, QD, TO TIMOLOL 0.5% OPHTHALMIC SOLUTION, BID, IN PATIENTS WITH POAG OR OHT

Meeting abstract


It is combined cataract/glaucoma surgery study published before April 2000


Does not address any key questions


It is combined cataract/glaucoma surgery study published before April 2000

It is combined cataract/glaucoma surgery study published before April 2000

Does not address any key questions

It is not a RCT and has less than 100 patients

Does not address any key questions

It is not a RCT and has less than 100 patients

It is not a RCT and has less than 100 patients

It is combined cataract/glaucoma surgery study published before April 2000

It is not a RCT and has less than 100 patients

It is a case series

It is not a RCT and has less than 100 patients
• "Shi, Y. [Clinical trial of timolol maleate ophthalmic solution for glaucoma (author's transl)]

Foreign language
• "Shirakashi, M., Yaoeda, K., Funaki, S., Nakatsue, T., Ohta, A., Suda, K., Hara, H., Fukichi, T., and Abe, H. LONG-TERM EFFECT OF TRABECULECTOMY USING AN ANTIMITABOLITE ON VISUAL FIELD DETEORATION IN NORMAL-TENSION GLAUCOMA Meeting abstract

It is not a RCT and has less than 100 patients
• "Shmeleva, O. A. [Comparative efficiency of the effects of conservative and surgical methods of treating primary open-angle glaucoma on blood supply of the optic nerve and retina]

Foreign language
• "Shmeleva, V. V., Mukhina, Z. A., and Nikol'skaia, G. M. [Analysis of the effectiveness of trabeculectomy]

Foreign language
• "Shoji, N., Araie, M., Shirato, S., and Nakano, Y. [A five-year follow-up of the effect of postoperative 5-fluorouracil subconjunctival injections on the surgical outcome of trabeculectomy]

Foreign language
• "Shoji, T., Tanito, M., Takahashi, H., Park, M., Hayashi, K., Sakurai, Y., Nishikawa, S., and Chihiro, E. Phacoviscocanalostomy versus cataract

**It is not a RCT and has less than 100 patients**

- "Shoji, Y. [Side effects of ophthalmic drugs]
  Foreign language
  Does not address any key questions
  It is not a RCT and has less than 100 patients
  No original data (e.g., systematic review, narrative review, editorial, letter)
- "Siamak, N. M., Camejo, L., and Noecker, R. J. Comparison of Short-Term Hyperemia and Comfort between Travoprost Solutions Containing Benzalkonium Chloride and No Benzalkonium Chloride
  Meeting abstract
- "Sicakova, S. and Vyborny, P. [Selective laser trabeculoplasty in glaucoma treatment--results during three years follow-up]
  Foreign language
- "Sidorov, E. G. [Clinical and drug treatment characteristics of glaucoma in young persons]
  Foreign language
- "Siegel, M. J., Camras, C. B., Lustgarten, J. S., and Podos, S. M. EFFECT OF FLURBIPROFEN (FL) ON THE REDUCTION OF INTRAOCULAR PRESSURE (IOP) FOLLOWING PARA-AMINOCLONIDINE (PAC) 1% IN GLAUCOMA PATIENTS
  Meeting abstract
  Data not abstractable
- "Siesky, B., Harris, A., Brizendine, E., Marques, C., Loh, J., Mackey, J., Overton, J., and Netland, P. Literature review and meta-analysis of topical carbonic anhydrase inhibitors and ocular blood flow
  Systematic review
  Data not abstractable
- "Siesky, B., Harris, A., Kagemann, L., Stefansson, E., McCranor, L., Miller, B., Bwatwa, J., Regev, G., and Ehrlich, R. Ocular blood flow and oxygen delivery to the retina in primary open-angle glaucoma patients: the addition of dorzolamide to timolol monotherapy
  Medical KQ 3 only
- "Siesky, B., Harris, A., Sines, D., Rechtman, E., Malinovsky, V. E., McCranor, L., Yung, C. W., and Zalish, M. A comparative analysis of the effects of the fixed combination of timolol and dorzolamide versus latanoprost plus timolol on ocular hemodynamics and visual function in patients with primary open-angle glaucoma
  Unique comparators
- "Sihota, R., Agarwal, H. C., and Rajashekar, Y. L. A comparative evaluation of pilocarpine 1% and clonidine 0.125% versus timolol 0.5%.
  Data not abstractable
  Meeting abstract
- "Sihota, R., Rajashekhar, Y. L., Venkatesh, P., and Agarwal, H. A prospective, long-term, randomized study of the efficacy and safety of the drug combination pilocarpine 1% with clonidine 0.06% or clonidine 0.125% versus timolol 0.25%. J Ocul Pharmacol Ther 2002 ;18 (6): 499-506.
  Other (specify):pilo and clonidine"
  OAG can’t be analyzed separately
  Medical KQ 3 only
  OAG can’t be analyzed separately
"Silver, L. H. Clinical efficacy and safety of brinzolamide (Azopt(TM)), a new topical carbonic anhydrase inhibitor for primary open-angle glaucoma and ocular hypertension

Medical KQ 3 or KQ 3 and KQ 6 only

"Silver, L. H. Clinical efficacy and safety of brinzolamide (Azopt), a new topical carbonic anhydrase inhibitor for primary open-angle glaucoma and ocular hypertension. Brinzolamide Primary Therapy Study Group

Unique comparators


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Silver, L. H., Garadi, R., and Timolol Gel Folding Solution Study Group. THE LONG-TERM SAFETY AND EFFICACY OF TIMOLOL MALEATE GEL FORMING SOLUTION IN PATIENTS WITH OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION Meeting abstract

"Silver, L. H., Martin, W., Hall, K., Turner, F. D., and The Brinzolamide Long-Term Therapy Study. AN ASSESSMENT OF CORNEAL HEALTH FOLLOWING LONG-TERM THERAPY WITH BRINZOLAMIDE (AZOPT) IN PATIENTS WITH OPEN-ANGLE GLAUCOMA AND OCULAR HYPERTENSION Meeting abstract


"Silverstone, B. Z. and Marcus, T. [Hypoglycemia due to ophthalmic timolol in a diabetic]

Foreign language

"Silverstone, D., Zimmerman, T., Choplin, N., Mundorf, T., Rose, A., Stoecker, J., Kelley, E., and Lue, J. Evaluation of once-daily levobunolol 0.25% and timolol 0.25% therapy for increased intraocular pressure

Medical KQ 3 or KQ 3 and KQ 6 only


Does not address any key questions


Other (specify): Not a comparison of interest

"Simmons, S. T and Brown, M. M. Comparison of Brimonidine with Latanoprost as Second-Line Therapy in Patients with Glaucoma or Ocular Hypertension Meeting abstract

"Simmons, S. T and Earl, M. COMPARISON OF LATANOPROST AND BRIMONIDINE AT TROUGH DRUG EFFECT IN PATIENTS UNCONTROLLED ON TOPICAL BETA-BLOCKERS Meeting abstract

"Simmons, S. T and Mehta, N. Safety and Efficacy of Brimonidine and Dorzolamide as Adjunctive Therapy in Glaucoma Meeting abstract

"Simmons, S. T. and Alphagan/Xalatan Study Group. THE SAFETY AND EFFICACY OF BRIMONIDINE AND LATANOPROST AS ADJUNCTIVE THERAPY IN GLAUCOMA Meeting abstract

"Simmons, S. T. and Earl, M. L. Three-month comparison of brimonidine and latanoprost as adjunctive therapy in glaucoma and ocular hypertension patients uncontrolled on beta-blockers: tolerance and peak intraocular pressure lowering Meeting abstract

Medical KQ 3 only

"Simmons, S. T. and Samuelson, T. W. Comparison of brimonidine with latanoprost in the adjunctive treatment of glaucoma Meeting abstract

Medical KQ 3 or KQ 3 and KQ 6 only
• "Simmons, S. T. and Samuelson, T. W. Comparison of brimonidine with latanoprost in the adjunctive treatment of glaucoma.
  ALPHAGAN/XALATAN Study Group
  Medical KQ 3 or KQ 3 and KQ 6 only
• "Simmons, S. T. and Samuelson, T. W. SAFETY AND EFFICACY OF BRIMONIDINE, DORZOLAMIDE AND LATANOPROST AS ADJUNCTIVE THERAPY IN THE TREATMENT OF GLAUCOMA
  Meeting abstract
• "Simmons, S. T. Efficacy of brimonidine 0.2% and dorzolamide 2% as adjunctive therapy to beta-blockers in adult patients with glaucoma or ocular hypertension
  Unique comparators
• "Simmons, S. T., Bernstein, P., and Hollander, D. A. A comparison of long-term intraocular pressure fluctuation in patients treated with bimatoprost or latanoprost
  Medical KQ 3 only
• "Simons, G., Melamed, S., and Lowery, J. A. Randomized Clinical Study Results Comparing Titanium:Sapphire Laser
  Meeting abstract
  Meeting abstract
• "Simpson, A. J., Gray, T. B., and Ballantyne, C. A controlled clinical trial of dorzolamide: a single-centre subset of a multicentre study
  Medical KQ 3 or KQ 3 and KQ 6 only
  Does not address any key questions (see below for questions), It is not a RCT and has less than 100 patients
  OAG can’t be analyzed separately
• "Singer, I., Romen, M., and Isakov, I. [Rare general side-effects after timolol eyedrops in glaucoma]
  Foreign language
• "Singh and Primary Trabeculectomy Antimetabolite Study Group.
  Intraoperative 5-Fluorouracil (5FU) vs Mitomycin C(MMC): The Primary. Trabeculectomy Antimetabolite Study
  Meeting abstract
  It is not a RCT and has less than 100 patients
• "Singh, K. and Primary Trabeculectomy Antimetabolite Study Group.
  Randomized Clinical Trial of Trabeculectomy with Intraoperative Mitomycin C versus 5-Fluorouracil: Intermediate Tests Results
  Meeting abstract
• "Singh, K., Egbert, P. R, Byrd, S., Budenz, D. L, Williams, A. S, Decker, J. H, and Dadzie, P. Trabeculectomy with Intraoperative 5-Flourouracil (5FU) vs. Mitomycin C (MMC): Randomized Clinical
  Meeting abstract
• "Singh, K., Egbert, P. R, Byrd, S., Williams, A. S, Decker, J. H, Foster, R. S, and Dadzie, P. Randomized Clinical Trial of Trabeculectomy with Adjunctive Intraoperative 5-Fluorouracil (5-FU) vs. Mitomycin-C (MMC)
  Meeting abstract
  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Singh, K., Egbert, p., Budenz, D., and Dadzie, P. RISK OF HYPOTONY FOLLOWING ANTIMETABOLITE TRABECULECTOMY IN A BLACK WEST AFRICAN POPULATION
  Meeting abstract
• "Singh, K., Egbert, p., Budenz, D., and Dadzie, P. RISK OF HYPOTONY FOLLOWING ANTIMETABOLITE TRABECULECTOMY IN A BLACK WEST AFRICAN POPULATION
  Meeting abstract
  Data not abstractable
Efficacy and tolerability of 2 presentations of eyedrops combining carteolol 2% and pilocarpine 2% in primary open-angle glaucoma and simple ocular hypertension

Foreign language

"Sirbat, D., George, J. L., Mayeux, D., Saudax, E., Kohler, C., Levan, D., and Grilliat, J. P. [Effects of systemic blockade of beta-blockers eyedrops]

Foreign language


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Meeting abstract


Meeting abstract


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Other (specify): ineligible drug


No original data (e.g., systematic review, narrative review, editorial, letter)

"Skorkovska, K. [Comparison of intraocular pressure lowering efficacy of bimatoprost / timolol fixed combination and other glaucoma medications in the treatment of glaucoma]

Foreign language

"Skripka, V. K. [Late results of trabeculectomy in primary glaucoma taking into account the trophic coefficient]

Foreign language


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Slavina, T. M. [Pilocarpine test and the dynamics of daily intraocular pressure fluctuations in open-angle glaucoma]

Foreign language


Does not address any key questions


No original data (e.g., systematic review, narrative review, editorial, letter)


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Smith, M. F. and Sherwood, M. B. A COMPARISON OF THE MOLTENO IMPLANT TO THE ACTSEB (SCHOCKET) PROCEDURE IN THE TREATMENT OF REFRACTORY GLAUCOMAS

Meeting abstract
  **It is not a RCT and has less than 100 patients**

  **Data not abstractable**

  **Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

• "Smith, R. J., Nagasubramanian, S., Watkins, R., and Poinoosawmy, D. Addition of timolol maleate to routine medical therapy: a clinical trial
  **Unique comparators**

  **Animal or in vitro data**

• "Smith, S. L., Sine, C. S., Pruitt, C. A., and Stewart, W. C. The use of latanoprost 0.005% once daily and its effect on intraocular pressure as primary or adjunctive therapy
  **Unique comparators**

  **Other (specify):pilocarpine**

• "Soderstrom, M. Medical vs surgical therapy in preventing visual field loss. Ophthalmology 2003 ;110 (2): 249; author reply 249.
  **No original data (e.g., systematic review, narrative review, editorial, letter)**

• "Sodhi, P. K., Pandey, R. M., and Ratan, S. K. Efficacy and safety of brimonidine, dorzolamide and latanoprost as adjunctive therapy in primary open angle glaucoma
  **Medical KQ 3 or KQ 3 and KQ 6 only**

  **No original data (e.g., systematic review, narrative review, editorial, letter)**

• "Solish, A. Bimatoprost and Travoprost in Clinical Practice of Glaucoma
  **Meeting abstract**

  **Just KQ 2 and/or 5**

• "Song, Y.-P., Zhu, L., Ding, Q., Zhao, X., and Huang, P.-C. Long-term effect of transscleral diode laser cyclophotocoagulation in treatment of refractory glaucoma
  **Foreign language**

  **Does not address any key questions**

  **Does not include treatment for open-angle glaucoma (medical, surgical or combined)**

• "Sonty, S. P., Sonty, S., and Viana, M. A. G. THE COMPARATIVE OCULAR HYPOTENSIVE EFFECTS OF TIMOLOL, BETAXOLOL AID OPTIPRANOLOL
  **Meeting abstract**

  **It is not a RCT and has less than 100 patients**

• "Sonty, S., Mundorf, T. K., Stewart, J. A., and Stewart, W. C. Short-term tolerability of once-daily timolol hemihydrate 0.5%, timolol maleate in sorbate 0.5%, and generic timolol maleate gel-forming solution 0.5% in glaucoma and/or ocular hypertension: a prospective, randomized, double-

Other (specify): Inadequate control groups, Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

- "Sood, S. and Wilensky, J. Comparative Efficacy of Travoprost vs Latanoprost in Lowering Intraocular Pressure in African Americans Meeting abstract
- "Sorensen, S. J and Abel, S. R. Comparison of the ocular beta-blockers (Brief record)
- It is not a RCT and has less than 100 patients
- It is not a RCT and has less than 100 patients
- No original data (e.g., systematic review, narrative review, editorial, letter)
- No original data (e.g., systematic review, narrative review, editorial, letter)
- Data not abstractable
- Does not address any key questions
- "Spiegel, D. and the European Latanoprost Study Group. A comparison of the safety and efficacy of lantanoprost (Xalatan®) versus the fixed combination of dorzolamide and timolol (Cosopt®) in patients with open angle glaucoma Meeting abstract
- Other (specify): No control
- It is not a RCT and has less than 100 patients
- It is not a RCT and has less than 100 patients
- It is not a RCT and has less than 100 patients
- It is a case series
  Meeting abstract
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Data not abstractable
  Data not abstractable
• “Sponsel, W. E. Timolol Vs pilocarpine in open angle glaucoma: The observation of significant differences in visual field response in patients with clinically equivalent IOP control. CHIBRET INT. J. OPHTHALMOL. 87 ;5 (3): 50-56 .
  Other (specify): pilocarpine
  Other (specify):unoprostone"
  OAG can’t be analyzed separately
  It is a case series
• “Sporova, N. A. [Results of the protracted use of prolonged action miotics in primary glaucoma]
  Foreign language
  Foreign language
• “Spratt, A., Ogunbowale, L., and Franks, W. Fixed Combination Timolol/Dorzolamide versus Timolol/Brimonidine: A Randomized Clinical Trial
  Meeting abstract
• “Sreckovic, S., Petrovic, M. J., Petrovic, N., and Vukosavljevic, M. [Comparison of primary medicament therapy effects and primary argon laser trabecuoplasty on regulation of intraocular pressure and stability of perimetry findings in open angle glaucoma]
  Foreign language
  Does not address any key questions
  It is not a RCT and has less than 100 patients
• “Stangogiannis D, Crisanti, Romero Q, Rafael, Naranjo Tackman, Ram n, Ozorno Zarate, Jorge, and Gil Carrasco, Fqlix. Inducci£n de cambio en el patr£n topogr¡fico en la cirugÆa filtrante de glaucoma
  Foreign language
  Other (specify):Testing physician learning curve only"
• “Stankiewicz, A. and Wierzbowska, J. [A multicentre, observative, non-invasive study of the tolerance of NYOLOL gel 0,1% in ocular hypertensive patients]
  Foreign language
  No original data (e.g., systematic review, narrative review, editorial, letter)

OAG can’t be analyzed separately


OAG can’t be analyzed separately


It is a case series

• “Stawska, M. [Comparative analysis of the results of modified sinussectomy and trabeculectomy in patients with primary open angle glaucoma]

Foreign language


OAG can’t be analyzed separately


It is not a RCT and has less than 100 patients

• “Stefan, C. and Dumitrca, D. M. [Ocular surface disfunction in glaucoma]

Foreign language

• “Stefan, C., Cucea, R., and Urena-Saenz, J. M. [Pseudoexfoliative glaucoma]

Foreign language


Foreign language

• “Stefanescu-Dima, A. S., Mocanu, C., Manescu, R., and Sfinescu-Dima, M. A. [Laser trabeculoplasty--a prospective study]

Foreign language

• “Stefaniu, I., Zemba, M., Nitulescu, C., and Nita, N. [A comparative study of the results of 2 technical variants of protective trabeculectomy]

Foreign language

• “Stefaniu, I., Zemba, M., Nitulescu, C., and Nita, N. [Comparison between two therapeutic approaches in patients with cataract and glaucoma]

Foreign language

• “Stefansson, E., Guomundsdottir, E., Sigurjonsdottir, J., Bjarnadottir, G., Masson, M., and Cyclodextrin drug delivery group. Methazolamide 1% in cycloplexterine aqueous eye drops lowers intraocular pressure in ocular hypertensive humans

Meeting abstract


It is not a RCT and has less than 100 patients

• “Steigerwalt Jr, R. D., Belcaro, G., Morazzoni, P., Bombardelli, E., Burki, C., and Schonlau, F. Mirtogenol (registered trademark) potentiates latanoprost in lowering intraocular pressure and improves ocular blood flow in asymptomatic subjects

Duplicate of 117


other (specify): not FDA approved. Does not include treatment for open-angle glaucoma (medical, surgical or combined)


It is a case series


OAG can’t be analyzed separately


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


It is a case series


"Stewart, J. A., Koester, J., Kapik, B., Pugh, S., and Stewart, W. C. THE IOP DIURNAL CURVE IN COAG OR OHT PATIENTS TREATED WITH RESCULA 0.12% OR TIMOLOL MALEATE 0.5% Meeting abstract


"Stewart, R. and The Brinzolamide Comfort Study Group. THE OCULAR COMFORT OF TID-DOSED BRINZOLAMIDE 1.0% COMPARED TO TID-DOSED DORZOLAMIDE 2.0% IN PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION Meeting abstract

"Stewart, R. H., Kimbrough, R. L., and Ward, R. L. Betaxolol vs timolol. A six-month double-blind comparison Medical KQ 3 or KQ 3 and KQ 6 only

"Stewart, W. C., Harasymowycz, P., Hutnik, C. M L, and Nicolela, M. The Efficacy and Safety of Latanoprost 0.005% versus Timolol Maleate 0.5% Gel Forming Solution Each Given Once Every Evening in Primary Open-Angle Glaucoma or Ocular Hypertension Meeting abstract

"Stewart, W. C., Mundorf, T., Haque, R., Brown, A., Kapik, B., Shams, N., and The Unoprostone Study Group. Comparison of the IOP-lowering efficacy and safety of the docosanoid unoprostone isopropyl 0.15% versus timolol maleate 0.5% dosed twice daily for 6 months in patients with primary open-angle glaucoma or ocular hypertension Meeting abstract


"Stewart, W. C. THE USE OF SUBCONJUNCTIVAL 5-FLUOROURACIL FOLLOWING COMBINED TRABECULECTOMY AND CATARACT EXTRACTION Meeting abstract


"Stewart, W. C., Cohen, J. S., Netland, P. A., Weiss, H., and Nussbaum, L. L. Efficacy of carteolol hydrochloride 1% vs timolol maleate 0.5% in patients with increased intraocular pressure. Nocturnal Investigation of Glaucoma Hemodynamics Trial Study Group Medical KQ 3 or KQ 3 and KQ 6 only


"Stewart, W. C., Crow, W. M., and Carlson, A. N. Results of combined phacoemulsification and trabeculectomy in patients with elevated preoperative intraocular pressures. J Glaucoma 95 ;4 (3): 164-9 . It is not a RCT and has less than 100 patients

It is combined cataract/glaucoma surgery study published before April 2000


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Unique comparators


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Other (specify): study design does not match KQ (KQ3)

"Stewart, W. C., Day, D. G., Stewart, J. A., Schuur, J., and Latham, K. E. The efficacy and safety of latanoprost 0.005% once daily versus brimonidine 0.2% twice daily in open-angle glaucoma or ocular hypertension

Medical KQ 3 only


Data not abstractable

"Stewart, W. C., Halper, L. K., Johnson-Pratt, L., Polis, A., and Hartenbaum, D. Tolerability and efficacy of dorzolamide versus acetazolamide added to timolol

Unique comparators

"Stewart, W. C., Halper, L. K., Najarian, D., Johnson-Pratt, L., and Hartenbaum, D. TOLERABILITY AND EFFICACY OF DORZOLAMIDE VERSUS ACETAZOLAMIDE IN PATIENTS WITH OCULAR HYPERTENSION OR OPEN-ANGLE GLAUCOMA

Meeting abstract

"Stewart, W. C., Hollo, G., and Passmore, C. L. The Efficacy of Timolol Maleate 0.5% versus Brinzolamide 1% Each Given Twice Daily Added to Travoprost 0.004% in Patients With Ocular Hypertension or Open-angle Glaucoma

Meeting abstract

"Stewart, W. C., Konstas, A. G. P., Kozobolis, V. P., Tersis, I., and Leech, J. N. The Efficacy and Safety of the Timolol/dorzolamide Fixed Combination Versus Latanoprost in Exfoliation Glaucoma

Meeting abstract


Systematic review


Systematic review

"Stewart, W. C., Laibovitz, R., Horwitz, B., Stewart, R. H., Ritch, R., and Kottler, M. A 90-day study of the efficacy and side effects of 0.25% and 0.5% apraclonidine vs 0.5% timolol. Apraclonidine Primary Therapy Study Group. Arch Ophthalmol 96 ;114 (8): 938-42.

Data not abstractable

"Stewart, W. C., Laibovitz, R., Horwitz, B., Stewart, R. H., Ritch, R., and Kottler, M. A 90-day study of the efficacy and side effects of 0.25% and 0.5% apraclonidine vs 0.5% timolol. ARCH. OPHTHALMOL. 96 ;114 (8): 938-942.

Does not include treatment for open-angle glaucoma (medical, surgical or combined)

"Stewart, W. C., Leland, T. M., Cate, E. A., and Stewart, J. A. Efficacy and safety of timolol solution once daily versus timolol gel in treating elevated intraocular pressure
Medical KQ 3 or KQ 3 and KQ 6 only
- "Stewart, W. C., Pfeiffer, N., and Mathis, H. M. Meta-analysis of articles evaluating routine intraocular pressure control in monotherapy in the United States and Germany
  Systematic review
  Data not abstractable
  Other (specify):apraclonidine"
  It is a case series
- "Stewart, W. C., Sharpe, E. D., Harbin, T. S. Jr, Pastor, S. A., Day, D. G., Holmes, K. T., and Stewart, J. A. Brimonidine 0.2% versus dorzolamide 2% each given three times daily to reduce intraocular pressure
  Medical KQ 3 or KQ 3 and KQ 6 only
- "Stewart, W. C., Sharpe, E. D., Stewart, J. A., and Hott, C. E. The safety and efficacy of timolol 0.5% in xanthan gum versus timolol gel forming solution 0.5%
  Unique comparators
- "Stewart, W. C., Sharpe, E. D., Stewart, J. A., Holmes, K. T., and Latham, K. E. Additive efficacy of unoprostone isopropyl 0.12% (rescula) to latanoprost 0.005%. Am J Ophthalmol 2001;131 (3): 339-44.
  Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  Meeting abstract
  Medical KQ 3 or KQ 3 and KQ 6 only
  It is combined cataract/glaucoma surgery study published before April 2000
  Does not address any key questions
  Other (specify):Unoprostone"
  Other (specify):combination not FDA approved"
- "Stewart, W. C., Stewart, J. A., Day, D., and Sharpe, E. D. Efficacy and safety of timolol maleate/latanoprost fixed combination versus timolol maleate and brimonidine given twice daily
  Non-FDA-approved drug combination
  No original data (e.g., systematic review, narrative review, editorial, letter)
- "Stewart, W., Beehler, C., McDonald, D., Croyle, T., Ostrov, C., Rosanellt, E., and Brandl, A. THE EFFICACY OF LEVOBUNOLOL 0.25% BID IN PATIENTS SWITCHED FROM TIMOLOL 0.5% BID THERAPY
  Meeting abstract
- "Stillitano, Iane Gongalves, Ribeiro, Marco Polo, Brandt, Carlos Teixeira, and Cabral, Juliana. Impacto economico do custo de colÆrios no tratamento da Glaucoma
  Foreign language
**OAG can't be analyzed separately**

**Does not address any key questions**

**It is not a RCT and has less than 100 patients**

**No original data (e.g., systematic review, narrative review, editorial, letter)**

• "Strahlman, E. R., Barber, B. L., and Laibovitz, R. B. A COMPARISON OF QUALITY OF LIFE AND PATIENT PREFERENCE OF DORZOLAMIDE AND PILOCARPINE AS ADJUNCTIVE THERAPY TO TIMOLOL IN THE TREATMENT OF GLAUCOMA 
**Meeting abstract**
• "Strahlman, E. R., Deasy, D., and Panebianco, D. A TWO-WEEK PILOT ACTIVITY STUDY OF A FIXED COMBINATION OF TIMOLOL AND DORZOLAMIDE HYDROCHLORIDE 
**Meeting abstract**
**Meeting abstract**

**Duplicate 8395**
• "Strahlman, E., Tipping, R., and Vogel, R. A double-masked, randomized 1-year study comparing dorzolamide (Trusopt), timolol, and betaxolol 
**Medical KQ 3 or KQ 3 and KQ 6 only**
• "Strahlman, E., Tipping, R., and Vogel, R. A double-masked, randomized 1-year study comparing dorzolamide (Trusopt), timolol, and betaxolol 
International Dorzolamide Study Group 
**Medical KQ 3 or KQ 3 and KQ 6 only**
• "Strahlman, E., Tipping, R., and Vogel, R. A six-week dose-response study of the ocular hypotensive effect of dorzolamide with a one-year extension. Dorzolamide Dose-Response Study Group 
**Duplicate 8392**
**Unique comparators**


**short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

**It is not a RCT and has less than 100 patients**

**No subjects with open-angle glaucoma**

**Other (specify):pilocarpine**
• "Strohmaier, K., Snyder, E., DuBiner, H., and Adamsons, I. The efficacy and safety of the dorzolamide-timolol combination versus the concomitant administration of its components 
**Medical KQ 3 or KQ 3 and KQ 6 only**
• "Strohmaier, K., Snyder, E., DuBiner, H., and Adamsons, I. The efficacy and safety of the dorzolamide-timolol combination versus the concomitant administration of its components. Dorzolamide-Timolol Study Group Medical KQ 3 or KQ 3 and KQ 6 only


• "Stryz, J. R. and Merte, H. J. [Pressure lowering effect and side effects of 0.5% and 1.0% levobunolol eyedrops, compared with 0.5% timolol eyedrops in patients with open-angle glaucoma]

Foreign language


It is not a RCT and has less than 100 patients

• "Sturm, A., Vogel, R., Binkowitz, B., and The Timolol-Pilocarpine Clinical Study Groups. A fixed combination of Timolol and Pilocarpine: double-masked comparisons with timolol and with pilocarpine Excluded drug

• "Subrez Pqrez, Juana Caridad and La Rosa Chibbs, Teresa. Uso del 5-fluorocil en la trabeculectomía y esclerocitomía profunda perforante durante cinco años

Foreign language


It is a case series

• "Suda, K. [Our investigations on glaucoma studies at the department of ophthalmology, Kumamoto University]

Foreign language


It is a case series

• "Sugimoto, R., Kuwayama, Y., Hashitani, T., and Tanaka, Y. COMPARISON OF TIMOLOL AND UNOPROSTONE IN CIRCADIAN VARIATION OF HYPOTENSIVE EFFECT Meeting abstract


• Does not address any key questions


It is not a RCT and has less than 100 patients

• "Suda, K. [Our investigations on glaucoma studies at the department of ophthalmology, Kumamoto University]

Foreign language

• "Sunder, P., Laus, K. N., Dosen, V. M., Ekert, M., Mandic, Z., and Bojic, L. Comparison of evening and morning dosing of travoprost 0.004%/timolol 0.5% fixed combination in 6 month period. Coll Antropol 2010 ;34 (3): 847-52 .

It is not a RCT and has less than 100 patients


It is a case series


No original data (e.g., systematic review, narrative review, editorial, letter)

• "Susanna Junior, Remo and Costa, Vital Paulino. Estudo comparativo entre o maleato de timolol 0.5 e betaxolol 0.5 na redução da pressão intraocular de pacientes submetidos a trabeculectomia

Foreign language

• "Susanna Junior, Takahashi Walter Y. Estudo comparativo entre o uso do 5-fluoro-uracil e da mitomicina em olhos trabeculectomizados
**Foreign language**

- "Susanna, R. Jr and Sheu, W. P. Comparison of latanoprost with fixed-combination dorzolamide and timolol in adult patients with elevated intraocular pressure: an eight-week, randomized, open-label, parallel-group, multicenter study in Latin America

**Medical KQ 3 or KQ 3 and KQ 6 only**


- **Does not include treatment for open-angle glaucoma (medical, surgical or combined)**


- **Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**

- "Sussman, Adriana and Vives, Patricia. Bolsa encapsulada en cirugía de trabeculectomía con base fornix y base limbo

**Foreign language**


- **It is a case series**


**Medical KQ 3 or KQ 3 and KQ 6 only**


- **Other (specify):study design does not match KQ (KQ3)**

- "Swendris, R., Chou, F., Shin, D., Parrow, K., Uhm, K., and Juzych, M. TRABECULECTOMY WITH RELEASABLE SCLERAL FLAP SUTURES AND ADJUNCTIVE LOW DOSE 5-FUOROURACIL VERSUS MOLTENO IMPLANT IN ADVANCED APHAKIC AND PSEUDOPHAKIC GLAUCOMA

**Meeting abstract**

- "Swendris, R., Chou, F., Shin, D., Parrow, K., Uhm, K., and Juzych, M. TRABECULECTOMY WITH RELEASABLE SCLERAL FLAP SUTURES AND ADJUNCTIVE LOW DOSE 5-FUOROURACIL VERSUS MOLTENO IMPLANT IN ADVANCED APHAKIC AND PSEUDOPHAKIC GLAUCOMA

**Meeting abstract**

- "Sycha, T., Vass, C., Findl, O., Bauer, P., Groke, I., Schmetterer, L., and Eichler, H. G. WITHDRAWN: Interventions for normal tension glaucoma

**Systematic review**

- "Sycha, T., Vass, C., Findl, O., Bauer, P., Groke, I., Schmetterer, L., and Eichler, H. Interventions for normal tension glaucoma

**Duplicate of 202"
• "Szaflik, J., Liberek, I., Kaminska, A., Chudzynska-Zawadzka, D., Borucka, A. I., and Sklodowska, A. [Phacoemulsification combined with trabeculectomy from personal material]
Foreign language
• "Szaflik, J., Zawadzka, D., and Zaleska-Zmijewska, A. [Diode laser cyclophotocoagulation—effect on intraocular pressure in comparison with cycloidiathermy under the scleral flap]
Foreign language
Foreign language
• "Tabak, S., de Waard, P. W. T., Lemij, H. G., and Remeijer, L. Selective laser trabeculoplasty in glaucoma
Meeting abstract
It is not a RCT and has less than 100 patients
• "Takahashi, N. [Cytotoxic effects of antiglaucoma agents on cultured human conjunctival cells (author's transl)]
Foreign language
Does not address any key questions
Other (specify):Study design does not match KQ (KQ3)
Other (specify):combination not FDA approved"
• "Taniguchi, M., Oki, H., Mori, M., and Nakahama, M. [A case of fatal asthma induced by timolol eye-drop]
Foreign language
It is not a RCT and has less than 100 patients
• "Tanaka, G. H., Vold, S. D., and Ruderman, J. M. PRIMARY COMBINED PHACOEMULSIFICATION AND TRABECULECTOMY VERSUS PHACOEMULSIFICATION ALONE IN PATIENTS WITH WELL-CONTROLLED GLAUCOMA: EARLY OUTCOMES
Meeting abstract
• "Tanenbaum, H., Connor, C., Simmons, S. T., and Alphagan/Trusopt Study Group. A PHARMACOECONOMIC ANALYSIS COMPARING BRIMONIDINE BID TO DORZOLAMIDE TID AS ADJUNCTIVE THERAPY IN GLAUCOMA
Meeting abstract
• "Taniguchi, M., Kino, H., Mori, M., and Nakahama, M. [A case of fatal asthma induced by timolol eye-drop]
Foreign language
It is not a RCT and has less than 100 patients
• "Tanaka, G. H., Vold, S. D., and Ruderman, J. M. PRIMARY COMBINED PHACOEMULSIFICATION AND TRABECULECTOMY VERSUS PHACOEMULSIFICATION ALONE IN PATIENTS WITH WELL-CONTROLLED GLAUCOMA: EARLY OUTCOMES
Meeting abstract
• "Tanenbaum, H., Connor, C., Simmons, S. T., and Alphagan/Trusopt Study Group. A PHARMACOECONOMIC ANALYSIS COMPARING BRIMONIDINE BID TO DORZOLAMIDE TID AS ADJUNCTIVE THERAPY IN GLAUCOMA
Meeting abstract
Other (specify):No control
It is a case series
It is a case series

• Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

• "Tanna, A. P., Rademaker, A. W., Stewart, W. C., and Feldman, R. M. Meta-analysis of the efficacy and safety of alpha2-adrenergic agonists, beta-adrenergic antagonists, and topical carbonic anhydrase inhibitors with prostaglandin analogs Systematic review

Does not address any key questions

Does not address any key questions


It is a case series

It is not a RCT and has less than 100 patients

Does not address any key questions

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


• "Teus Guezala, M. A., Arranz Marquez, E., Morales Bertrand, J., and Marcos De La Huerga, A. [Ocular hypotensive effect of pilocarpine in latanoprost treated eyes; a pilot study]
Foreign language

Other (specify):not FDA approved"

It is combined cataract/glucoma surgery study published before April 2000

It is combined cataract/glucoma surgery study published before April 2000

It is not a RCT and has less than 100 patients

It is not a RCT and has less than 100 patients

No original data (e.g., systematic review, narrative review, editorial, letter)

Other (specify):link with other AGIS articles Other (specify):AGIS"


• "The European glaucoma prevention study (EGPS). Aims and methods. Acta Ophthalmol. Scand. Suppl. 99 ;77 (229): 12 . No original data (e.g., systematic review, narrative review, editorial, letter) Other (specify):link to EGPS, No original data (e.g., systematic review, narrative review, editorial, letter)"


• "The Levobunolol Study Group. Levobunolol. A beta-adrenoceptor antagonist effective in the long-term treatment of glaucoma. The Levobunolol Study Group Duplicate"

• "The ocular effects of prostaglandins and other eicosanoids Foreign language"Theeuwes, F., Bayne, W., and McGuire, J. Gastrointestinal therapeutic system for acetazolamide. Efficacy and side effects

Medical KQ 3 or KQ 3 and KQ 6 only
• "Thelen, U., Buchholz, P., and Kimmich, F. Treatment of patients with primary open-angle glaucoma with a fixed combination of brimonidine 0.2% / timolol 0.5%: multicenter, open-label, observational study in Germany. Curr Med Res Opin 2009 ;25 (4): 1003-9 . Other (specify): Study design does not match KQ (KQ3)"


• "Thomas, R., Jacob, P., Braganza, A., Mermod, A., and Muliyil, J. Releasable suture technique for trabeculectomy. Indian J Ophthalmol 97 ;45 (1): 37-41 . It is a case series"


• "Thomas, R., Parikh, R., Muliyil, J., George, R., Paul, P., and Abraham, L. M. Comparison between latanoprost and brimonidine efficacy and safety in Indian eyes. Indian J Ophthalmol 2003 ;51 (2): 123-8 . It is not a RCT and has less than 100 patients"


• "Thorburn, W. Comparison of timolol and pilocarpine combination versus concomitant therapy with separate components: A swedish multicenter study Excluded drug"


• "Thyer, H. W. and Wilson, P. Trabeculectomy. Br J Ophthalmol 72 ;56 (1): 37-40 . It is not a RCT and has less than 100 patients"

No original data (e.g., systematic review, narrative review, editorial, letter)

- "Thygesen, J. [Betaxolol. A new beta blockader with beta-1-selectivity in glaucoma treatment]
  
  Foreign language

  
  It is a case series

  
  Data not abstractable

  
  It is not a RCT and has less than 100 patients

  
  Other (specify):Study design does not match KQ

- "Titouamane, S. and Baudouin, C. [Use of brimonidine 0.2% in treatment of glaucoma or ocular hypertony after poorly tolerated beta-blocker treatment]" Foreign language

- "Titouamane, S. and Baudouin, C. Use of brimonidine 0.2% in treatment of glaucoma or ocular hypertony after poorly tolerated (beta)-blocker treatment: Interet de la brimonidine 0,2% dans le traitement du glaucome ou de l'hypertension intraoculaire apres intolerance a un traitement par (beta)-bloquant
  
  Duplicate "

- "Tomisaka, S., Nakanishi, T., and Hashimoto, A. Medical therapy of glaucoma with topical bupranolol hydrochloride. FOLIA OPHTHALMOL. JPN.  79 ;30 (8): 1167-1172 .
  
  It is not a RCT and has less than 100 patients

- "Tomita, G., Araie, M., Kitazawa, Y., and Tsukahara, S. A three-year prospective, randomized and open comparison between latanoprost and timolol in Japanese normal-tension glaucoma patients
  
  Medical KQ 3 or KQ 3 and KQ 6 only

  
  It is not a RCT and has less than 100 patients

  
  Non-FDA-approved drug combination

  
  Meeting abstract

  
  No original data (e.g., systematic review, narrative review, editorial, letter)

- "Topouzis, F., Melamed, S., Danesh-Meyer, H., Wells, A. P., Kozobolis, V., Wieland, H., Andrew, R., and Wells, D. A 1-year study to compare the efficacy and safety of once-daily travoprost 0.004%/timolol 0.5% to once-daily latanoprost 0.005%/timolol 0.5% in patients with open-angle glaucoma or ocular hypertension. Eur J Ophthalmol  2007 ;(2): 183-90 .
  
  Other (specify):not FDA approved combination"

- "Topouzis, F., Yu, F., and Coleman, A. L. Factors associated with elevated rates of adverse outcomes after cyclodestructive procedures versus drainage device procedures. Ophthalmology  98 ;105 (12): 2276-81 OAG can’t be analyzed separately

  
  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

  
  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not address any key questions


Does not address any key questions

- "Tost, M., Herde, J., Fincke, S., and Nook, O. [Tolerance and tachyphylaxis during the long-term local treatment of different forms of glaucoma with Arutimol]

Foreign language


OAG can't be analyzed separately


Does not address any key questions


OAG can't be analyzed separately


Does not address any key questions


Data not abstractable


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not address any key questions


No original data (e.g., systematic review, narrative review, editorial, letter)

- "Trepsat, C., Roussille, M., and Genoulaz, L. [Timolol maleate, a new beta-blocker in the treatment of chronic simple glaucoma]

Foreign language


Other (specify): case report of harm"


No original data (e.g., systematic review, narrative review, editorial, letter)

- "Tressler, C. S., Cyrlin, M. N., and Fazio, R. MITOMYCIN C IN GLAUCOMA FILTERING SURGERY A COMPARISON OF SUBCONJUNCTIVAL TO INTRASCALER ADMINISTRATION Meeting abstract"

- "Tressler, C. S., Susanna, R. Jr, and Latin American Latanoprost Study Group. Latanoprost and Fixed Combination Dorzolamide + Timolol in Patients With Elevated Intraocular Pressure. An 8-week, Open-label, Multicenter Study in Latin America
Meeting abstract


Duplicate"

- "Trinquand, C., Romanet, J.-P., Nordmann, J.-P., and Allaire, C. Efficacy and safety of long-acting carteolol 1% once daily. A double-masked, randomized study: Efficacite et tolerance du carteolol 1% a liberation prolongee une fois par jour: Etude randomisee en double insu

Foreign language


Systematic review

- "Troiano, P., Cavallotti, B., Iraci, M., Galli, L., and Miglior, M. Pressure-reducing efficacy and tolerability of betaxolol in ionic solution

Medical KQ 3 or KQ 3 and KQ 6 only


No subjects with open-angle glaucoma


Animal or in vitro data

- "Tsai, J. C. A comprehensive perspective on patient adherence to topical glaucoma therapy

Systematic review


OAG can’t be analyzed separately


Other (specify): Study design does not match KQ


Does not address any key questions


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

- "Tsukamoto, H., Noma, H., Matsuyama, S., Ikeda, H., and Mishima, H. K. The efficacy and safety of topical brinzolamide and dorzolamide when added to the combination therapy of latanoprost and a beta-blocker in patients with glaucoma

Medical KQ 3 or KQ 3 and KQ 6 only

- "Tsukamoto, H., Noma, H., Mukai, S., Ikeda, H., and Mishima, H. K. The efficacy and ocular discomfort of substituting brinzolamide for dorzolamide in combination therapy with latanoprost, timolol, and dorzolamide

Medical KQ 3 or KQ 3 and KQ 6 only


Does not address any key questions


Does not include treatment for open-angle glaucoma (medical, surgical or combined)

- "Tsyranko, T. A. [Immediate and late results of trabeculectomy in glaucoma]

Foreign language
• "Tugushi, O. A., Shliapuzhnikova, A. V., and Listopadova, N. A. [Comparative analysis of life quality in patients receiving beta-blockers and xalathane (latanoprost)]
Foreign language
Data not abstractable
Meeting abstract
• "Tuovinen, E. [Treatment of chronic glaucoma]
Foreign language
OAG can't be analyzed separately
No subjects with open-angle glaucoma
Does not include treatment for open-angle glaucoma (medical, surgical or combined)
Data not abstractable
It is a case series
• "Tuulonen, A. Economic considerations of the diagnosis and management for glaucoma in the developed world
Systematic review
No original data (e.g., systematic review, narrative review, editorial, letter)
Does not address any key questions
It is not a RCT and has less than 100 patients
• "Twer, A., Anand, R., and Kooner, K. S. LOW DOSE VS HIGH DOSE MITOMYCIN-C WITH GLAUCOMA FILTRATION SURGERY IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA
Meeting abstract
Other (specify):case series
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
• "Ullman, S., Fisher, S. J., Lavine, J. B., Mandell, A. I., and Ostrov, C. S. OCULAR HYPOTENSIVE EFFECT OF COMBINATION AGENT LEVOBUNOLOL 0.5%/DIPIVEFRIN 0.1%
Meeting abstract
It is a case series
• "Urban, V., Kammann, M. T., and Sturmer, J. P. [Glaucoma and cataract: combined operation or trabeculectomy first and cataract extraction later?]
**Foreign language**

- "Uretmen, O., Ates, H., Guven, S., and Andac, K. Comparison of outcomes of viscocanalostomy and phacoviscocanalostomy

**Medical KQ 3 or KQ 3 and KQ 6 only**


**Other (specify):** Not a comparison we are interested in (pneumatic trabeculoplasty)

- "Uva, M. G., Avitabile, T., Panta, G., Cro, M., Giuffrida, S., and Reibaldi, A. A NEW ANTI-GLAUCOMA MUCOADHESIVE ASSOCIATION: 0.5% TIMOLOL - 2% PILOCARPINE IN SODIUM HYALURONATE VEHICLE AND ITS IOP LOWERING EFFECTS

**Meeting abstract**

- "Uva, M. G., Avitabile, T., Panta, G., Russo, V., and Reibaldi, A. INTRAOPERATIVE 5-FU PLUS TITRATED TRABECULECTOMY: OUR PRELIMINARY RESULTS

**Meeting abstract**


**Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study**


**It is not a RCT and has less than 100 patients**

- "Uva, M., Avitabile, T., Russo, V., Ott, J., D’Agata, V., and Reibaldi, A. IS YAG LASER IRIDOTOMY USEFUL IN CASE OF PIGMENTARY GLAUCOMA?

**Meeting abstract**

- "Urisitalo, R. J., Palkama, A., and Stjernschantz, J. A study of the efficacy of two commercial preparations of timolol maleate with special reference to side effects

**Data not abstractable**


**Other (specify):** T-gel not FDA approved


**Does not include treatment for open-angle glaucoma (medical, surgical or combined)**


**Does not include treatment for open-angle glaucoma (medical, surgical or combined)**


**Data not abstractable**

It is a case series

"Vaidergorn, Paulo Gelman, Susanna J-nior, Remo, Borges, Adriana Silva, and Giampani J-nior, Jair. Tempo de terapWutica propiciado por frasco de colÆrios hipotensores oculares

Foreign language


No subjects with open-angle glaucoma

"Vajaranant, T. S., Price, M. O., Price, F. W., Gao, W., Wilensky, J. T., and Edward, D. P. Visual acuity and intraocular pressure after Descemet's stripping endothelial keratoplasty in eyes with and without preexisting glaucoma

Systematic review


Does not address any key questions (see below for questions). It is a case series


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Vallino, I. V. and Petukhova, M. S. [A modified glaucoma operation with incisions]

Foreign language

"Valle MJ, MartÆnez A, MarÆa R. Eficacia de la mitomicina C vs 5 fluoracilo en trabeculectomÆa de pacientes con diagn£stico de glaucoma primario de bngulo abierto atendidos en el Centro Nacional de OftalmologÆa de noviembre del 2001-noviembre del 2002 Welsh unable to locate PDF

"Valle, O., Klemetti, A., and Takki, K. K. [Timolol maleate in the treatment of chronic open-angle glaucoma]

Foreign language

"Valnickova, J. [Results of long-term treatment of glaucoma with timolol]

Foreign language


It is a case series

"van Beuningens, E. [The importance of stabilised drug therapy of glaucoma (glaucoma simplex)]

Foreign language


OAG can’t be analyzed separately


No original data (e.g., systematic review, narrative review, editorial, letter)


No original data (e.g., systematic review, narrative review, editorial, letter)


Other (specify):Study design does not match KQ

"van der Valk, R., Webers, C. A., Lumley, T., Hendrikse, F., Prins, M. H., and Schouten, J. S. A network meta-analysis combined direct and indirect comparisons between glaucoma drugs to rank effectiveness in lowering intraocular pressure

Systematic review


It is a case series

Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

Meeting abstract

"VanDenburgh, A. M., Laibovitz, R. A., and Felix, C. A ONE-MONTH DOSE-RESPONSE STUDY OF AGN 192024, A NOVEL ANTIGLAUCOMA AGENT, IN PATIENTS WITH ELEVATED INTRAOCULAR PRESSURE
Meeting abstract

"Varga, M. and Follmann, P. [Ultrastructural studies of the conjunctival surface following long-term treatment with timolol]
Foreign language


It is not a RCT and has less than 100 patients


Other (specify):not FDA approved"

"Varma, R., Hwang, L. J., Grunden, J. W., Bean, G. W., and Sultan, M. B. Assessing the efficacy of latanoprost vs timolol using an alternate efficacy parameter: the intervisit intraocular pressure range
Systematic review


No original data (e.g., systematic review, narrative review, editorial, letter)

"Vasineca, I. D., Furtuna, A., Vasineca, D., and Cociu, M. [Laser trabecuoplasty--3 years of experience]
Foreign language


It is not a RCT and has less than 100 patients

"Velloso, Luiz. Tumelização da trabeculectomia
Foreign language

"Ventura, Antonio Guillerme Gonsalves de Melo, Cavalcanti, Hellmann Dantas Olinda, Holanda, Andrå Gi芬oni Siebra de, Cardoso, Get lio, and Trigueiro, LuEs. Tratamento de bolhas hiperfiltrantes por sutura de compressPo
Foreign language

"Verin, P., Vildy, A., Cales, R., and Bapt, J. B. [New indications for timoptol eyedrops]
Foreign language


It is not a RCT and has less than 100 patients


Data not abstractable


It is not a RCT and has less than 100 patients

"Vetrugno, M., Cardascia, N., Cantatore, F., and Sborgia, C. Comparison of the effects of bimatoprost and timolol on intraocular pressure and pulsatile ocular blood flow in patients with primary open-angle glaucoma: A prospective, open-label, randomized, two-arm, parallel-group study
Medical KQ 3 or KQ 3 and KQ 6 only


It is not a RCT and has less than 100 patients

It is not a RCT and has less than 100 patients

- "Vieira, Juan Carlos, Gonzalez Vivas, Deodq, and Reyes Feo, Mar/Ea. Uso intraoperatorio de Mitomicina C en cirugia/EA filtrante de glaucoma
  Foreign language
  It is a case series
- "Villon, J. C., Dubiez, M., Charleux, J., and Etienne, R. [Remote tonometric results of trabeculectomy]
  Foreign language
  Does not include treatment for open-angle glaucoma (medical, surgical or combined)
  Does not address any key questions
  Systematic review
  Does not address any key questions
- "Virno, M., Missori, E., Pecori Giraldi, J., and Pica, B. Double-blind study of timolol and pilocarpine in open-angle glaucoma: CONFRONTO A DOPPIO CIECO TRA TIMOLOLO E PILOCARPINA NEL GLAUCOMA AD ANGOLO APERTO
  Foreign language
  Foreign language
- "Vizzeri, G., Weinreb, R. N., Martinez de la Casa, J. M., Alencar, L. M., Bowd, C., Balasubramanian, M., Medeiros, F. A., Sample, P., and Zangwill, L. M. Clinicians agreement in establishing glaucomatous progression using the Heidelberg retina tomograph
  Systematic review
- "Vogel, A. [European Glaucoma Prevention Study (EGPS). Examination of the effectiveness of dorzolamide on the reduction of intraocular pressure for prevention of glaucoma in patients with ocular hypertension]
  Meeting abstract
  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study
- "Vogel, R. Surface toxicity of timolol. Ophthalmology  93 ;100 (3): 293-4
  No original data (e.g., systematic review, narrative review, editorial, letter)
  Other (specify):cannot find age"
- "Vogel, R., Tipping, R., Kulaga Jr., S. F., and Clineschmidt, C. M. Changing therapy from timolol to betaxolol: Effect on intraocular pressure in selected patients with glaucoma
  Medical KQ 3 or KQ 3 and KQ 6 only
- "Vogel, R., Tipping, R., Kulaga, S. F., and Clineschmidt, C. M. Changing therapy from timolol to betaxolol. Effect on intraocular pressure in selected patients with glaucoma. Timolol-Betaxolol Study Group
  Medical KQ 3 or KQ 3 and KQ 6 only
- "Vold, S. D., Evans, R. M., Stewart, R. H., Walters, T., and Mallick, S. A one-week comfort study of BID-dosed brinzolamide 1%/timolol 0.5% ophthalmic suspension fixed combination compared to BID-dosed dorzolamide 2%/timolol 0.5% ophthalmic solution in patients with open-angle glaucoma or ocular hypertension. J Ocul Pharmacol Ther  2008 ; 24 (6): 601-5 .
  Other (specify):involves non FDA approved drug combo"
"Vold, S. D., Krupin, T., Ruderman, J. M., and Tanaka, G. LONG-TERM OUTCOMES OF INITIAL TRABECULECTOMY WITH 5-FLUOROURACIL
Meeting abstract
Duplicate of 9584 "
"Vonwil, A., Landolt, M., Flammer, J., and Bachofen, H. [Bronchoconstrictive side effects of timolol eye drops in patients with obstructive lung disease]
Foreign language
"Voudouri, A., Zafirakis, P., Livir-Rallatos, G., Markomichelakis, N., Mitsonis, I., and Baltatzis, S. Standard versus separate phacotrabeculectomy: a randomized study
Meeting abstract
OAG can’t be analyzed separately
It is combined cataract/glaucoma surgery study published before April 2000
It is a case series
"Vymazal, M., Valkova, Z., Polachova, M., Dokonalova, E., Dragounova, H., and Jezdinsky, J. [Clinical trial of Pilogel HS made by Alcon]
Foreign language
"Wade, A. and Banla, M. [Long-term tonometric results of trabeculectomy in Black Africa patients (apropos of 119 cases of chronic open-angle glaucoma surgically treated at the Ophthalmological Clinical of University Medical Center at Dakar)]
Foreign language
No original data (e.g., systematic review, narrative review, editorial, letter)
"Walters, T. and Shapiro, A. A TWELVE WEEK COMPARISON OF THE EFFICACY, SAFETY, AND QUALITY OF LIFE EFFECTS OF BRIMONIDINE/LATANOPROST VERSUS TIMOLOL/LATANOPROST DUAL THERAPY
Meeting abstract
"Walters, T. R and Brimonidine-PuriteTM Study Group. 12-month evaluation of Brimonidine-PuriteTM compared with Alphagan® in patients with glaucoma or ocular hypertension
Meeting abstract
"Walters, T. R, DuBiner, H. B, Carpenter, S., and Vandenburgh, A. M. 24-HOUR DIURNAL COMPARISON OF ONCE-DAILY DOSING WITH BIMATOPROST 0.03%, TIMOLOL-XE 0.5%, AND LATANOPROST 0.005%
Meeting abstract
"Walters, T. R., DuBiner, H. B., Carpenter, S. P., Khan, B., and VanDenburgh, A. M. 24-Hour IOP control with once-daily bimatoprost,

Data not abstractable

- "Walters, T. R., Maloney, S., Slater, D., Liss, C., Wilson, H., and Hartenbaum, D. Efficacy and tolerability of 0.5% timolol maleate ophthalmic gel-forming solution QD compared with 0.5% levobunolol hydrochloride BID in patients with open-angle glaucoma or ocular hypertension.

Medical KQ 3 or KQ 3 and KQ 6 only

- "Walters, T. R., Shapiro, A. M., and Chapin, M. J. A COMPARISON OF THE EFFICACY, SAFETY, AND QUALITY OF LIFE OF BRIMONIDINE WITH LATANOPROST VS. LATANOPROST WITH TIMOLOL.

Meeting abstract


It is combined cataract/glaucoma surgery study published before April 2000


Medical KQ 3 or KQ 3 and KQ 6 only


Systematic review


Foreign language


Foreign language

- "Wang, R. F., Gao, X. W., Yan, X. D., Dong, X. Y., and Ji, X. X. [Clinical observation on the quadratic adjustment suture in glaucoma trabeculectomy].

Foreign language


Medical KQ 3 or KQ 3 and KQ 6 only

- "Wang, T., Zhao, M., and Yang, X.-Z. Primary study on cyanoacrylate used in trabeculectomy.

Foreign language


Duplicate


Does not address any key questions


No original data (e.g., systematic review, narrative review, editorial, letter)


It is not a RCT and has less than 100 patients


No original data (e.g., systematic review, narrative review, editorial, letter)


OAG can’t be analyzed separately


OAG can’t be analyzed separately


It is a case series

- "Watillon, M. and Robe-Vanwijck, A. [Harmful effects of common drugs on the visual apparatus. Cardiovascular drugs].

Foreign language
"Watson, P. and Stjernschantz, J. A six-month, randomized, double-masked study comparing latanoprost with timolol in open-angle glaucoma and ocular hypertension. The Latanoprost Study Group

Duplicated


Meeting abstract

"Watson, P. G and Grierson, I. Early trabeculectomy in the treatment of chronic open-angle glaucoma in relation to histological changes

Excluded drug

"Watson, P. G. Latanoprost. Two years' experience of its use in the United Kingdom. Latanoprost Study Group

Medical KQ 3 or KQ 3 and KQ 6 only

"Watson, P. G. Latanoprost. Two year's experience of its use in the United Kingdom

Medical KQ 3 or KQ 3 and KQ 6 only


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

"Watson, P. G., Barnett, M. F., Parker, V., and Haybittle, J. A 7 year prospective comparative study of three topical beta blockers in the management of primary open angle glaucoma

Medical KQ 3 only


Medical KQ 3 only


No original data (e.g., systematic review, narrative review, editorial, letter)


4 ( Pt 3) : 425-38

OAG can't be analyzed separately


Medical KQ 3 or KQ 3 and KQ 6 only


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


Does not include treatment for open-angle glaucoma (medical, surgical or combined)


Systematic review


It is combined cataract/glaucoma surgery study published before April 2000

"Weekers, R., Demailly, P., and Collignon-Brach, J. [Considerations on the value of pilocarpine treatment in open angle glaucoma] Foreign language


"Weinreb, R. N., Caldwell, D. R., Goode, S. M., Horwitz, B. L., Laibovitz, R., Shrader, C. E., Stewart, R. H., and Williams, A. T. A double-masked three-month comparison between 0.25% betaxolol suspension and 0.5% betaxolol opthalmic solution

Medical KQ 3 or KQ 3 and KQ 6 only

D-183
"Weinreb, R. N., Ruderman, J., Juster, R., and Wilensky, J. T. Influence of the number of laser burns administered on the early results of argon laser trabeculoplasty. American journal of ophthalmology 83 ;95 (3): 287-92 . Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study"

"Weinreb, R. N., Ruderman, J., Juster, R., and Zweig, K. Immediate intraocular pressure response to argon laser trabeculoplasty. American journal of ophthalmology 83 ;95 (3): 279-86 . Does not address any key questions"


"Weisbrod, L. and Motolko, M. A. A Long-Term Comparative Study between Phacoemulsification Trabeculectomy and ECCE Trabeculectomy Meeting abstract"

"Weiss, H. HEMODYNAMIC AND INTRAOCULAR PRESSURE EFFECTS OF TIMOLOL AND CARTEOLOL IN PATIENTS WITH OCULAR HYPERTENSION AND PRIMARY OPEN ANGLE GLAUCOMA Meeting abstract"

"Weller, R., George, R., Enzenauer, R., and Cornell, F. THE EFFECT ON INTRAOCULAR PRESSURE (IOP) AFTER SUBSTITUTION OF LEVOBUNOLOL FOR TIMOLOL IN PATIENTS CONTROLLED ON TIMOLOL OR TIMOLOL AND DIPIVERIN Meeting abstract"

"Wells, A. P. and Poostchi, A. Prostaglandin Analogues Increase Corneal Hysteresis Measurements, but Not Independently of Intraocular Pressure Meeting abstract"

"Welsh, N. H. Trabeculectomy with fistula formation in the African. Br J Ophthalmol 72 ;56 (1): 32-6 . It is not a RCT and has less than 100 patients"


"Whitson JT, Trattler WB, Matossian C, Williams J, and Hollander DA. Ocular surface tolerability of prostaglandin analogs in patients with glaucoma or ocular hypertension Library unable to locate"

"Whitson, J. T and Sullivan, E. K. SAFETY AND EFFICACY OF TRAVOPROST COMARED TO TIMOLOL 0.5% Meeting abstract"

"Whitson, J. T, Henry, C., Terry, S. A, Hughes, B. A, and Lee, D. A. Comparison of the IOP Effect and Tolerability of Dorzolamide 2% t.i.d vs. Brimonidine 0.2% t.i.d. for 6 Weeks in Patients with POAG or OHT Meeting abstract"


"Whitson, J. T., Henry, C., Hughes, B., Lee, D. A., Terry, S., and Fechtner, R. D. Comparison of the safety and efficacy of dorzolamide 2% and brimonidine 0.2% in patients with glaucoma or ocular hypertension Medical KQ 3 or KQ 3 and KQ 6 only"


"Whitson, J. T., Ochsner, L. I., Moster, M. R., James, J. E., Andrew, R. M., Silver, L. H., Wells, D. T., James, J. E., Bosworth, C. F., Dickerson, J. E., Landry, T. A., and Bergamini, M. V. The safety and intraocular pressure-lowering efficacy of brimonidine tartrate 0.15% preserved with polyquaternium-1 Unive comparators"

"Whitson, J. T., Trattler, W. B., Matossian, C., Williams, J., and Hollander, D. A. Ocular surface tolerability of prostaglandin analogs in patients with glaucoma or ocular hypertension Medical KQ 3 or KQ 3 and KQ 6 only"

- It is not a RCT and has less than 100 patients


- It is not a RCT and has less than 100 patients


- It is not a RCT and has less than 100 patients

• "Wigginton, S. A., Krishnadas, R., Ramakrishnan, R., and Robin, A. L. THE COMBINATION OF BOTH BRIMONIDINE 0.2 % AND LATANOPROST 0.005 % IN THE TREATMENT OF GLAUCOMA Meeting abstract

- It is a case series


Medical KQ 3 or KQ 3 and KQ 6 only


- It is a case series


Medical KQ 3 or KQ 3 and KQ 6 only

- It is a case series

• "Wilkson, J. and Willcockson, T. Timolol: double-blind comparison with pilocarpine in open-angle glaucoma. CURR. THER. RES. CLIN. EXP. 80;27 (4): 538-544.

- It is not a RCT and has less than 100 patients

• "Williams, R. D., Noreeck, R., Dirks, M., and Earl, M. IOP Lowering Efficacy of Bimatoprost and Latanoprost for the Treatment of Normal Tension Glaucoma

Meeting abstract

• "Williams, R. D. Efficacy of bimatoprost in glaucoma and ocular hypertension unresponsive to latanoprost. Adv Ther 2002;19 (6): 275-81

- It is not a RCT and has less than 100 patients

• "Williams, R. D., Cohen, J. S., Gross, R. L., Liu, C. C., Safyan, E., and Batoosingh, A. L. Long-term efficacy and safety of bimatoprost for intraocular pressure lowering in glaucoma and ocular hypertension: year 4

Medical KQ 3 or KQ 3 and KQ 6 only

• "Williams, R. D., Cohen, J. S., Liu, R., Safyan, E., and Batoosingh, A. L. Long-Term Efficacy and Safety of Bimatoprost For IOP Lowering in Glaucoma and Ocular Hypertension: Results From the Extension of the Pivotal Trials Through Year 4

Meeting abstract

• "Williams, R. D., Dirks, M., Batoosingh, A. L., Felix, C., Whitcup, S. M., and Brimonidine–Purite Study Group. A 3-month Comparison of Brimonidine-Purite 0.15% BID With Brimonidine 0.2% BID in Patients Successfully Treated With Brimonidine 0.2% BID

Meeting abstract

• "Willman, M. R., Rechtner, R. D., Khouri, A. S., and Zimmerman, T. J. LATANOPROST IS ADDITIVE TO MULTIPLE MEDICAL THERAPY INCLUDING CHOLINERGIC AGENTS

Meeting abstract


Data not abstractable


Does not address any key questions


OAG can’t be analyzed separately


OAG can’t be analyzed separately

• "Wilson, M. R., Paliwal, A. R., Mendel, U., Smith, S., and Gil, F. CLINICAL TRIAL OF TRABECULECTOMY VS. AHMED IMPLANT

Meeting abstract


Data not abstractable

"Wilson, R. P. and Steinmann, W. C. Use of trabeculectomy with postoperative 5-fluorouracil in patients requiring extremely low intraocular pressure levels to limit further glaucoma progression. Ophthalmology 91 ;98 (7): 1047-52.
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study

OAG can't be analyzed separately

OAG can't be analyzed separately

Does not address any key questions

"Wirbelauer, C., Fischer-Schiessl, E., Zollner, F., and Pham, D. T. Covered sclerotomy as filtering glaucoma surgery: Die gedeckte sklerotomie als fistulierende glaukom-operation
Foreign language

It is a case series

Other (specify):No control group

No subjects with open-angle glaucoma

It is a case series

It is combined cataract/glaucoma surgery study published before April 2000

"Wishart, P. K. Trabeculectomy is not the best surgical option for glaucoma. Eye (Lond) 2008 ;(5): 603-6.
No original data (e.g., systematic review, narrative review, editorial, letter)

"Wishart, P. K., Wishart, M. S., and Poroooshani, H. Viscoanalogostomy and deep sclerectomy for the surgical treatment of glaucoma: a longterm follow-up
Unique comparators

Data not abstractable

"Wojcik-Mazurowska, L. and Jaworowska, H. [The use of pilocarpine ointment in the treatment of glaucoma]
Foreign language

It is a case series

Does not address any key questions

"Wolter-Czerwinska, H. and Nowak, A. [Timolol in simple glaucoma: action after one instillation of the drug (author's transl)]
Foreign language

"Wong, D. C, Cameron, B. D, and Liu, H. The Intraocular Pressure (IOP) Effect of Pilocarpine Use When Latanoprost Is Added to the Glaucoma Medical Regimen
Meeting abstract


Other (specify):Includes angle-closure glaucoma


Data not abstractable


Does not address any key questions


Does not address any key questions


Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


"Wright, P. Squamous metaplasia or epidermalization of the conjunctiva as an adverse reaction to topical medication. Trans Ophthalmol Soc UK 79 ;99 (2): 244-6.

Does not address any key questions

"Wu, L. and Yin, J. [The effect of mitomycin C on filtration surgery of glaucoma with poor prognosis]

Foreign language

"Wu, N. Z. [Evaluation of timolol in the treatment of glaucoma (author's transl)]

Foreign language


Data not abstractable

"WuDunn, D., Palanca-Capistrano, A. M., Hall, J., Cantor, L. B., and Morgan, L. Long-Term Outcomes of Intraoperative 5-Flourouracil Versus Intraoperative Mitomycin C in Primary Trabeculectomy Surgery Meeting abstract


Other (specify):No comparison


It is not a RCT and has less than 100 patients


It is combined cataract/glaucoma surgery study published before April 2000


"Xia, X., Huang, P., Jiang, Y., Wang, C., and Yang, C. [The clinical effect after locally using mitomycin C during trabeculectomy in glaucoma]

Foreign language

"Xiao, X., Peigang, H., Youqing, J., Chenye, W., and Changquan, Y. The clinical effect after partial using mitomycin C during trabeculectomy in glaucoma

Foreign language
"Xiong, X. L., Jiang, Y. Q., and Wu, Z. Z. [The anti-cicatrization effect of low dosage 5-Furacil after trabeculectomy in late glaucoma]"  
Duplicated"  
"Xiong, X. L. [The anti-cicatrization effect of low dosage 5-Fu after trabeculectomy in late glaucoma]"  
Foreign language  
"Xiong, X., Jiang, Y., Wu, Z., and Jiang, Y. Long-term efficacy of low dosage of 5-Fu after trabeculectomy in late glaucoma on anti-fibroblasts proliferation"  
Foreign language  
"Xu, D.-H., Hao, L., and Liu, W.-L. Effects comparison on three implanted materials in NPTS operation"  
Foreign language  
"Xu, L., Ma, K., and Zhang, W. Clinical observation of the effect of (beta) Ophthiole on reducing intraocular pressure in glaucoma patients"  
Meeting abstract  
OAG can't be analyzed separately  
Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study  
Meeting abstract  
It is not a RCT and has less than 100 patients  
"Yalvac, I. S., Sahin, M., Eksioglu, U., Midillioglu, I. K., Aslan, B. S., and Duman, S. Primary viscocanalostomy versus trabeculectomy for primary open-angle glaucoma: three-year prospective randomized clinical trial Cheng 2009 and Chai 2010  
It is combined cataract/glaucoma surgery study published before April 2000  
"Yamamoto, T. and Kuwayama, Y. Interim clinical outcomes in the collaborative bleb-related infection incidence and treatment study. Ophthalmology 2011 ;118 (3; status =Department of Ophthalmology, Gifu University Graduate School of Medicine, Gifu, Japan.): 453-8 .  
OAG can't be analyzed separately  
"Yamamoto, T., Kitazawa, Y., Azuma, I., Tsukahara, S., and Nakashima, M. Clinical evaluation of a new formula of timolol maleate (WP-934 ophthalmic solution) Medical KQ 3 or KQ 3 and KQ 6 only  
Other (specify):non-FDA approved"  
It is a case series  
"Yan, D. B. A 12-week Comparison of Travoprost and Timolol in the Treatment of Newly Diagnosed, Normal Tension Glaucma"  
Meeting abstract  
"Yan, D. B., Battista, R. A., Haidich, A. B., and Konstas, A. G. Comparison of morning versus evening dosing and 24-h post-dose efficacy of travoprost compared with latanoprost in patients with open-angle glaucoma. Curr Med Res Opin 2008 ; Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study  
It is combined cataract/glaucoma surgery study published before April 2000  
Other (specify):No comparison of interest"  
"Yanhong, Z., Jingzhen, L., and Tiansheng, H. Clinical studies of D-timolol vs L-timolol"  
Meeting abstract
  OAG can’t be analyzed separately
• "Yao, K., Shen-Tu, X. C., Xu, W., and Chen, P. Q. [Combined surgery for cataract and glaucoma: phacoemulsification, foldable intraocular lens implantation and viscocanalostomy]
Foreign language
No subjects with open-angle glaucoma
• "Yarangumeli, A., Gureser, S., Koz, O. G., Elhan, A. H., and Kural, G. Viscocanalostomy versus trabeculectomy in patients with bilateral high-tension glaucoma
  Chai 2010 
  Does not address any key questions
  It is not a RCT and has less than 100 patients
• "Yates, D. Syncope and visual hallucinations, apparently from timolol. JAMA 80 ;244 (8): 768-9 .
  It is not a RCT and has less than 100 patients
  Does not address any key questions
  It is not a RCT and has less than 100 patients
  Systematic review
  Data not abstractable
  OAG can’t be analyzed separately
• "Yu, K., Peng, D., and Liu, X. [A comparative study of homoharringtonine with 5-fluorouracil in filtering surgery]
Foreign language
• "Yuan, M., Li, Y., and Ge, J. [The ocular hypotensive effect and safety of 0.2% brimonidine]
Foreign language
  Does not address any key questions
• "Yuan, J. and Wei, H. [A clinical observation of the therapeutic effects of pilocarpine gel for treatment of glaucoma]
Foreign language
• "Yuan, J. Y. and Wei, H. R. [A clinical observation of the therapeutic effect of pilocarpine gel for treatment of glaucoma]
Foreign language
• "Yuan, Z. L., Yang, Q., Chen, Q., Zhang, W. Z., and Sun, H. [Modified viscocanalostomy for the surgical treatment with primary open angle glaucoma]
Foreign language
• "Yuan, Z.-L., Sun, H., Wang, L.-L., Wang, L.-N., and Yu, H. Comparison of domatic brimonidine tartrate eye drops with Alphagan to treat primary open -angle glaucoma or ocular hypertension
Foreign language
  It is a case series
• "Yuksel, N., Altintas, O., Karabas, L., Alp, B., and Caglar, Y. The short-term effect of adding brimonidine 0.2% to timolol treatment in patients with open-angle glaucoma. Ophthalmologica 99; 213 (4): 228-33.

  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


  It is not a RCT and has less than 100 patients


  Does not include treatment for open-angle glaucoma (medical, surgical or combined)


  Short term follow up only (less than 1 month for medical study/1 year for surgical study) but it is not a 24 hour study


  It is a case series

• "Zabriskie, N. A, Ahmed, I. K, Cantor, L. B, Kent, A. B, Mundorf, T., Tauber, J., Rubin, J. M, and Hoop, J. Efficacy and safety of combination therapy with brimonidine 0.2% and latanoprost 0.005% versus fixed combination timolol 0.5%/dorzolamide 2%

  Meeting abstract

• "Zabriskie, N. and Netland, P. A. Comparison of brimonidine/latanoprost and timolol/dorzolamide: two randomized, double-masked, parallel clinical trials

  Non-FDA-approved drug combination


  It is not a RCT and has less than 100 patients


  Other (specify):arms not specified"


  It is a case series


  It is a case series

• "Zapata Rojas, Jenny and Castellanos, Rosendo. Estudio comparativo entre técnica Base limbo y Base fornix con sutura retirable

  Foreign language


  Other (specify):Mixed glaucoma"

• "Zatoukal, Z., Dolezal, P., and Sklubalova, Z. [Liberation of pilocarpine from therapeutic lenses]

  Foreign language

• "Zavorkova, M. and Susicky, P. [Five years retrospective study of latanoprost glaucoma treatment]

  Foreign language


  Meeting abstract


  Does not include treatment for open-angle glaucoma (medical, surgical or combined)


  Meeting abstract
• "Zhao, J., Li, X., Li, R., Hu, S., and Zhang, C. J. [A preliminary report on treatment of glaucoma with timolol]
  Duplicate"

• "Zhou, W., Liu, Y., Ye, T., Hu, S., and Zhang, C. J. [A preliminary report on treatment of glaucoma with timolol]

• "Zhu, B.-L. and Zhong, Q. A comparative study between trabeculectomy combined with phacoemulsification and glaucoma surgery by stages
  Foreign language"

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  **OAG can’t be analyzed separately**

  **Does not include treatment for open-angle glaucoma (medical, surgical or combined)**

  **It is not a RCT and has less than 100 patients**

  **No original data (e.g., systematic review, narrative review, editorial, letter)**

  **It is a case series**

• “Zou, Y., Lin, Z., and Zhou, J. [Comparison between one-site and two-site incision in phacotrabeceuctomy] Foreign language

  **Does not address any key questions**
## Glaucoma Medications: FDA Approval Status

<table>
<thead>
<tr>
<th>Pharmacologic category</th>
<th>Generic Name</th>
<th>US Brand Name</th>
<th>FDA Status</th>
<th>Approval Date</th>
<th>Marketing Status</th>
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<td>Non-selective beta-adrenergic receptor blocker</td>
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<td>Prostaglandin Analogs</td>
<td>Latanoprost</td>
<td>Xalatan®</td>
<td>Approved - NDA 020597</td>
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<td>Combined</td>
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<td>Timabak</td>
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<td>BIOPHYSIC MEDICAL INC.</td>
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<td>COBURN OPTICAL IND. INC.</td>
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*Note: SE = Special Clearance, Registered = Registered Device, n/a = Not Available.
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