Complete Summary

GUIDELINE TITLE

Primary open-angle glaucoma.

BIBLIOGRAPHIC SOURCE(S)

Glaucoma Panel, Preferred Practice Patterns Committee. Primary open-angle glaucoma. San Francisco (CA): American Academy of Ophthalmology (AAO); 2005. 36 p. (Preferred practice pattern). [232 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: American Academy of Ophthalmology Glaucoma Panel, Preferred Practice Patterns Committee. Primary open-angle glaucoma. Limited revision. San Francisco (CA): American Academy of Ophthalmology (AAO); 2003. 37 p.

All Preferred Practice Patterns are reviewed by their parent panel annually or earlier if developments warrant and updated accordingly. To ensure that all Preferred Practice Patterns are current, each is valid for 5 years from the "approved by" date unless superseded by a revision.

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Primary open-angle glaucoma

GUIDELINE CATEGORY

Diagnosis
Management
Treatment

CLINICAL SPECIALTY

Ophthalmology

INTENDED USERS

Health Plans
Physicians

GUIDELINE OBJECTIVE(S)

To preserve visual function while minimizing adverse effects of therapy, thereby enhancing the patient's health and quality of life by addressing the following goals:

- Document the status of optic nerve structure and function on presentation.
- Estimate a pressure below which further optic nerve damage is unlikely to occur.
- Attempt to maintain intraocular pressure (IOP) at or below this target level by initiating appropriate therapeutic intervention(s).
- Monitor the structure and function of the optic nerve for further damage and adjust the target intraocular pressure to a lower level if deterioration occurs.
- Minimize the side effects of treatment and their impact on the patient's vision, general health, and quality of life.
- Educate and involve the patient in the management of the disease.

TARGET POPULATION

Adults with primary open-angle glaucoma (POAG)

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

1. Comprehensive medical eye evaluation in addition to and with special attention to those factors that particularly bear upon the diagnosis, course, and treatment of primary open-angle glaucoma
2. Review of family, ocular, and systemic history
3. Physical examination including examination of the pupil, a slit-lamp biomicroscopy of the anterior segment, measurement of intraocular pressure with a Goldmann-type applanation tonometer, determination of central corneal thickness, gonioscopy, evaluation of the optic nerve head and retinal nerve fiber layer, evaluation of the fundus, and evaluation of the visual field

Management/Treatment

1. Medical treatment

    - Prostaglandin analogs and beta-adrenergic antagonists (most frequently used)
    - Alpha$_2$-adrenergic agonists, topical and oral carbonic anhydrase inhibitors, and parasympathomimetics
2. Surgical procedures
    - Laser trabeculoplasty
    - Filtering surgery
    - Cyclodestructive surgery
3. Periodic follow-up, including history, physical examination, and gonioscopy, and adjustment of therapy, as needed
4. Patient education, counseling, and referral

MAJOR OUTCOMES CONSIDERED

- Visual function
- Quality of life

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

In the process of revising this document, a detailed literature search of articles in the English language was conducted on the subject of primary open-angle glaucoma (POAG) for the years 1999 to 2004.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Ratings of Strength of Evidence:

- Level I provides strong evidence in support of the statement. The design of the study allowed the issue to be addressed, and the study was performed in the population of interest, executed in such a manner as to produce accurate and reliable data, and analyzed using appropriate statistical methods. The study produced either statistically significant results or showed no difference in results despite a design specified to have high statistical power and/or narrow confidence limits on the parameters of interest.

- Level II provides substantial evidence in support of the statement. Although the study has many of the attributes of one that provides Level I support, it lacks one or more of the components of Level I.
- Level III provides a consensus of expert opinion in the absence of evidence that meets Levels I and II.

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The results of a literature search on the subject of primary open-angle glaucoma were reviewed by the Glaucoma Panel and used to prepare the recommendations, which they rated in two ways. The panel first rated each recommendation according to its importance to the care process. This "importance to the care process" rating represents care that the panel thought would improve the quality of the patient's care in a meaningful way. The panel also rated each recommendation on the strength of the evidence in the available literature to support the recommendation made.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Ratings of importance to care process

Level A, most important
Level B, moderately important
Level C, relevant but not critical

COST ANALYSIS

A published cost analysis was reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

These guidelines were reviewed by Council and approved by the Board of Trustees of the American Academy of Ophthalmology (September 2005).

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Ratings of importance to the care process (A-C) and ratings of strength of evidence (I-III) are defined at the end of the "Major Recommendations" field.

Diagnosis

The comprehensive initial glaucoma evaluation (history and physical examination) includes all components of the comprehensive adult eye evaluation (Preferred Practice Patterns Committee, 2005) in the addition to and with special attention to those factors that specifically bear upon the diagnosis, course, and treatment of primary open-angle glaucoma (POAG). Completion of the evaluation may require more than one visit. For instance, an individual might be identified as having glaucoma on one visit but may return for further evaluation, including additional intraocular pressure (IOP) measurements, central corneal thickness determination, visual field assessment, and optic nerve head evaluation and documentation.

History

The comprehensive initial glaucoma evaluation includes a review of ocular, [A:III] family (Dielmans et al., 1994), [A:II] and systemic history. [A:III] It also includes an assessment of the impact of visual function on daily living and activities (Gutierrez et al., 1997; Lee et al., 1998; Parrish et al., 1997; Sherwood et al., 1998; Wilson et al., 1998); [A:III] review of pertinent records [A:III] with particular reference to the status of the optic nerve, visual field, and IOP; [A:III] ocular surgery; [A:III] the use of ocular and systemic medications; [A:III] known local or systemic intolerance to glaucoma medications; [A:III] adherence to the treatment regimen and time of last use of glaucoma medications; [B:III] and severity and outcome of glaucoma in family members, including history of visual loss from glaucoma (Tielsch et al., 1994; Wolfs et al., 1998). [B:III]

Physical Examination

Pupil

The pupils are examined for reactivity and an afferent pupillary defect (Kohn, Moss, & Podos, 1979; Brown et al., 1987). [B:II]

Anterior Segment

A slit-lamp biomicroscopic examination of the anterior segment can provide evidence of physical findings associated with narrow angles, corneal pathology, or a secondary mechanism for elevated IOP such as pseudoexfoliation, pigment dispersion, iris and angle neovascularization, or inflammation (Preferred Practice Patterns Committee, 2005). [A:III]

Intraocular Pressure

Intraocular pressure is measured in each eye, [A:III] preferably using a contact applanation method (typically a Goldmann tonometer) before gonioscopy or dilation of the pupil (Whitacre & Stein, 1993). [A:III] Time of day should be recorded because of diurnal variation (Whitacre & Stein, 1993). [B:III] The assessment may benefit from determining diurnal IOP fluctuations, either on the same day or on different days, which may be indicated when disc damage exceeds the amount expected based on a single IOP measurement.

Central Corneal Thickness

Measurement of central corneal thickness (pachymetry) aids the interpretation of IOP measurement results and stratification of patient risk (Herndon, Weizer, & Stinnett, 2004; Gordon et al., 2002; Kass et al., 2002; Agudelo, Molina, & Alvarez, 2002). [A:II] Measurement methods include ultrasonic and optical pachymetry.

Gonioscopy

The diagnosis of POAG requires careful evaluation of the anterior-chamber angle to exclude angle closure or secondary causes of IOP elevation, such as angle recession, pigment dispersion, peripheral anterior synechiae, angle neovascularization, and trabecular precipitates (Tasman, 2004). [A:III]

Optic Nerve Head and Retinal Nerve Fiber Layer

There is evidence that glaucomatous changes detected with optic disc and retinal nerve fiber layer analysis may precede changes detected by standard automated perimetry.

<u>Evaluation</u>

The preferred technique for optic nerve head and retinal nerve fiber layer evaluation involves magnified stereoscopic visualization (as with the slit-lamp biomicroscope), preferably through a dilated pupil. [A:III] Direct ophthalmoscopy is useful in some cases to complement magnified stereoscopic visualization, providing more comprehensive information of optic nerve detail due to the greater magnification of the direct ophthalmoscope. Red-free illumination may aid in evaluating the retinal nerve fiber layer. Inability to dilate (or the reason not to dilate) the pupil should be documented. [B:III]

<u>Documentation</u>

Color stereophotography or computer-based image analysis of the optic nerve head and retinal nerve fiber layer are the best currently available methods to document optic disc morphology and should be performed (Caprioli, Prum, & Zeyen, 1996; Uchida, Brigatti, & Caprioli, 1996; Anton et al., 1997; Schuman et al., 1995; American Academy of Ophthalmology, 1999; Kamal, Bunce, & Hitchings, 2000; Chauhan et al., 2001; Poinoosawmy et al., 2000; Zangwill et al., "The confolcal scanning laser," 2004; Zangwill et al., "Racial differences," 2004;

Zeyen et al., 2003). [A:II] In the absence of these technologies, a nonstereoscopic photograph or a detailed drawing of the optic nerve head should be recorded, but these are less desirable alternatives to stereophotography or computer-based imaging (Shaffer et al., 1975). [A:III]

Fundus

Examination of the fundus, through a dilated pupil whenever feasible, includes a search for other abnormalities that might account for visual field defects (e.g., optic nerve pallor, tilted disc, disc drusen, optic nerve pits, optic nerve hypoplasia, neurological disease, macular degeneration, and other retinal disease). [A:III]

Visual Field

Automated static threshold perimetry is the preferred technique for evaluating the visual field. [A:III] Careful manual combined kinetic and static threshold testing is an acceptable alternative when patients cannot perform automated perimetry reliably or if it is not available. [A:III] Causes of visual field loss other than glaucomatous optic neuropathy should be sought and assessed during the history review and physical examination (Anderson, 1989). [A:III] Visual field testing based on short wavelength automated perimetry and frequency doubling technology may detect defects earlier than conventional white-on-white perimetry. It is important to use a consistent examination strategy when visual field testing is repeated. [A:III]

Management

Target Intraocular Pressure

In managing the glaucoma patient, the ophthalmologist strives to achieve a stable range of measured IOPs deemed likely to retard further optic nerve damage. The estimated upper limit of that range is considered the "target pressure." At present, there is no a priori way to determine the pressure below which further optic nerve damage will be prevented in any particular patient. The initial target pressure is an estimate and a means toward the ultimate goal of protecting the optic nerve. The target pressure will vary among patients, and in the same patient it may need adjustment during the course of the disease.

When initiating therapy, the ophthalmologist assumes that the measured pretreatment pressure range contributed to optic nerve damage and is likely to cause additional damage in the future. The initial target pressure selected should be at least 20% lower than the pretreatment IOP, depending upon the clinical findings. [A:III] Further reduction of the target IOP is often also justified by the severity of existing optic nerve damage, the level of the measured pretreatment IOP, the rapidity with which the damage occurred, and other risk factors. In general, the more advanced the damage, the lower the initial target pressure should be. [A:III]

There are two clinically useful empirical observations about POAG:

- Past damage predicts future damage, unless the IOP is lowered.

- Damage in one eye is associated with a significantly increased risk of future damage in the other eye.

The severity of glaucoma damage can be estimated using the following scale:

- Mild: characteristic optic nerve abnormalities consistent with glaucoma and a normal visual field as tested with standard automated perimetry
- Moderate: characteristic optic nerve abnormalities consistent with glaucoma and visual field abnormalities in one hemifield and not within 5 degrees of fixation
- Severe: characteristic optic nerve abnormalities consistent with glaucoma and visual field abnormalities in both hemifields and loss within 5 degrees of fixation in at least one hemifield

The adequacy and validity of the target pressure are periodically reassessed by comparing optic nerve status (by optic disc appearance, quantitative assessments of the disc and nerve fiber layer, and visual field tests) with previous examinations. If progression occurs at the target pressure, the target IOP should be lowered. [A:III] Failure to achieve and maintain a target pressure should trigger a reassessment of the treatment regimen in light of potential risks and benefits of additional or alternative treatment. [A:III]

Therapeutic Choices

The IOP can be lowered by medical treatment, or by laser, filtering, or cyclodestructive surgery (alone or in combination). The choice of initial therapy depends on numerous considerations, and discussion of treatment with the patient should include appropriate options. [A:III]

In many instances, topical medications constitute effective initial therapy. Laser trabeculoplasty is an appropriate initial therapeutic alternative. [A:I] Filtering surgery is effective at lowering IOP and may sometimes be an appropriate initial therapeutic alternative instead of medications or laser trabeculoplasty. [A:I]

Medical Treatment

The prostaglandin analogs and the beta adrenergic antagonists are the most frequently used eye drops for lowering IOP in patients with glaucoma. Agents less frequently used include alpha$_2$ adrenergic agonists, topical and oral carbonic anhydrase inhibitors, and parasympathomimetics.

If a drug fails to reduce IOP, it should be replaced with an alternate agent until effective medical treatment is established. [A:III] If a single medication is effective in lowering IOP but the target pressure is not reached, combination therapy or switching to an alternative therapy may be appropriate.

The ophthalmologist should discuss the benefits and risks of medical treatment with the patient. [B:III] The ophthalmologist should assess the patient who is being treated with glaucoma medication for local and systemic side effects, toxicity, and possible interactions with other medications. [A:III] The ophthalmologist must be prepared to recognize potential life-threatening adverse

reactions. [A:III] To reduce systemic absorption, patients should be educated about eyelid closure or nasolacrimal occlusion when applying topical medications (Zimmerman et al., 1984). [B:II]

At each examination, medication dosage and frequency of use should be recorded. [A:III] Adherence to the therapeutic regimen and the patient's response to recommendations for therapeutic alternatives or diagnostic procedures should be discussed. [A:III]

Laser Trabeculoplasty

Laser trabeculectomy is an alternative for patients who cannot or will not use medications reliably due to cost, memory problems, difficulty with instillation, or intolerance to the medication.

The ophthalmologist who performs the surgery must ensure that the patient receives adequate postoperative care. [A:III] The plan for care prior to and after laser trabeculoplasty should include the following elements:

- At least one preoperative evaluation and IOP measurement by the surgeon [A:III]
- Informed consent prior to surgery [A:III]
- At least one IOP check within 30 to 120 minutes of surgery [A:I]
- A follow-up examination within 6 weeks of surgery or sooner if there is concern about IOP-related damage to the optic nerve during this time [A:III]

Filtering Surgery

Filtering surgery provides an alternative path for the escape of aqueous humor, and it often reduces IOP and the need for medical treatment.

Patients who require filtration surgery and who also have cataract may benefit from simultaneous cataract and glaucoma surgery, as may glaucoma patients with a visually significant cataract and severe, but well-controlled, glaucoma. Generally, combined cataract and glaucoma surgery is not as effective as glaucoma surgery alone in lowering intraocular pressure, so patients who require filtration surgery who also have mild cataract may be better served by filtration surgery alone and cataract surgery later.[B:III]

The plan for care before filtering surgery should include the following elements:

- At least one preoperative evaluation by the surgeon [A:III]
- Informed consent prior to surgery [A:III]

The ophthalmologist who performs the surgery must ensure that the patient receives adequate postoperative care, which includes the following: [A:III]

- Use of topical corticosteroids in the postoperative period, unless contraindicated [A:II]
- Follow-up evaluation on the first postoperative day (12 to 36 hours after surgery) by the surgeon and at least once from the second to the tenth

postoperative day to evaluate visual acuity, IOP, and status of the anterior segment [A:II]
- In the absence of complications, additional postoperative visits during a 6-week period to evaluate visual acuity, IOP, and status of the anterior segment [A:III]
- More frequent follow-up visits, as necessary, for patients with postoperative complications such as a flat or shallow anterior chamber or evidence of early bleb failure, increased inflammation, or Tenon's cyst formation [A:III]
- Additional treatments as necessary, including surgical procedures to correct a flat anterior chamber, repair bleb leaks, perform bleb massage, perform suture lysis, or perform bleb needling or other surgical revisions of the bleb to maximize the chances for a successful long-term result [A:III]
- A discussion between the surgeon and the patient to explain that filtration surgery places the eye at risk for endophthalmitis for the duration of the patient's life, and that the patient must regard the symptoms of pain and decreased vision and the signs of redness and discharge as a medical emergency that requires medical attention [A:III]

Cyclodestructive Surgery

Cyclodestructive procedures reduce the rate of aqueous production. In recent years, cyclodestructive procedures are more commonly performed using a transscleral laser delivery system but they can also be performed endoscopically. Because cyclodestructive procedures have been associated with subsequent decrease of visual acuity, and, rarely, cases of sympathetic ophthalmia, they are often reserved for eyes with reduced visual acuity and patients who are poor candidates for incisional surgery. The advantages and disadvantages of a cyclodestructive procedure compared with a filtration operation or a tube shunt procedure should be discussed with patients who are poor surgical candidates, have limited visual potential, or have undergone multiple previous glaucoma operations. [A:III]

Follow-up Evaluation

Patients with POAG should receive follow-up evaluations and care to monitor and treat their disease according to the guidelines summarized in Table 2 in the original guideline document. These recommendations apply to ongoing glaucoma management and not to visit for other purposes.

History

The following interval history should be elicited at POAG follow-up visits

- Interval ocular history [A:III]
- Interval systemic medical history [B:III]
- Side effects of ocular medications [A:III]
- Frequency and time of last intraocular pressure (IOP)-lowering medications, and review of use of medications [B:III]

Physical Examination

The following components of the physical examination should be performed at POAG follow-up visits:

- Visual acuity [A:III]
- Slit-lamp biomicroscopy [A:III]
- IOP and time of day of measurement [A:III]

Optic nerve head evaluation and documentation by imaging, photography, or drawing (Caprioli, Prum, & Zeyen, 1996; Shaffer et al., 1975; Zeyen & Caprioli, 1993; Airaksinen, Tuulonen, & Alanko, 1992) and visual field evaluation (Smith, Katz, & Quigley, 1996; Katz, Tielsch, & Quigley, 1995; Heijl & Asman, 1989; Jay & Murdoch, 1993) should be performed at the recommended intervals listed in Tables 3 and 4 of the original guideline document. Based on the understanding of the effect of central corneal thickness on IOP measurements (Herndon, Weizer, & Stinnett, 2004; Gordon et al., 2002; Kass et al., 2002), pachymetry should be repeated after any event (e.g., refractive surgery [Hjortdal et al., 2005]) that may alter central corneal thickness. [A:II]

Gonioscopy

Gonioscopy is indicated when there is a suspicion of an angle-closure component, anterior-chamber shallowing or anterior-chamber angle abnormalities, or if there is an unexplained change in IOP. [A:III] Gonioscopy should also be performed periodically (e.g., 1 to 5 years). [A:III]

Within each of the recommended intervals, factors that determine frequency of evaluations include the severity of damage (mild, moderate, severe), the stage of disease (more frequent evaluations for more severe disease), the rate of progression, the extent to which the IOP exceeds the target pressure, and the number and significance of other risk factors for damage to the optic nerve. [A:III] In certain cases, follow-up visual field testing may be required more or less frequently than the recommended intervals (e.g., a second test to establish a baseline for future comparisons, to clarify a suspicious test result, or to overcome an apparent testing artefact).

Adjustment of Therapy

The indications for adjusting therapy are as follows: [A:III]

- Target IOP is not achieved.
- A patient has progressive optic nerve damage despite achieving the target IOP. The validity of the diagnosis and target pressure should be reassessed. [A:III] Additional evaluation may reveal conditions that are contributing to the progression of damage and serving as a justification to escalate therapy. These evaluations include obtaining diurnal IOP measurements, repeating the central corneal thickness measurement to verify a thin cornea or a change in corneal thickness after refractive surgery, or seeking evidence of unrecognized low ocular perfusion pressure. A neurologic evaluation also may be considered.
- Patient is intolerant of the prescribed medical regimen.
- Patient does not adhere to the prescribed medical regimen.
- Contraindications to individual medicines develop.

- Stable optic nerve status and low IOP occurs for a prolonged period in a patient on pressure-lowering medications. Under these circumstances, a carefully monitored attempt to reduce the medical regimen may be appropriate.

Downward adjustment of target pressure should be made in the face of progressive optic disc or visual field change. [A:III] Upward adjustment of target pressure should be considered if the patient has been stable and if the patient either requires (because of side effects) or desires less medication. [B:III] The ophthalmologist should plan a follow-up visit in 2 to 8 weeks to assess the response and side effects from washout of the old medication or onset of maximum effect of the new medication. [A:III]

Provider and Setting

The performance of certain diagnostic procedures (e.g., tonometry, pachymetry, perimetry, optic disc imaging and photography) may be delegated to appropriately trained and supervised personnel. However, the interpretation of results and medical and surgical management of disease require the medical training, clinical judgment, and experience of the ophthalmologist.

Counseling/Referral

- Patients should be encouraged to alert their ophthalmologists to physical or emotional changes that occur when taking glaucoma medications. [A:III]
- Patients with significant visual impairment or blindness should be referred for and encouraged to use appropriate vision rehabilitation and social services (American Academy of Ophthalmology [AAO], 2001). [A:III]

Definitions:

Ratings of Importance to Care Process

Level A, most important
Level B, moderately important
Level C, relevant, but not critical

Ratings of Strength of Evidence

- Level I provides strong evidence in support of the statement. The design of the study allowed the issue to be addressed, and the study was performed in the population of interest, executed in such a manner as to produce accurate and reliable data, and analyzed using appropriate statistical methods. The study produced either statistically significant results or showed no difference in results despite a design specified to have high statistical power and/or narrow confidence limits on the parameters of interest.
- Level II provides substantial evidence in support of the statement. Although the study has many of the attributes of one that provides Level I support, it lacks one or more of the components of Level I.
- Level III provides a consensus of expert opinion in the absence of evidence that meets Levels I and II.

CLINICAL ALGORITHM(S)

A clinical algorithm for the management of patients with primary open-angle glaucoma is provided in the original guideline document.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Loss of vision from glaucoma may be retarded or prevented through early diagnosis and therapy.

POTENTIAL HARMS

- The ophthalmologist must be prepared to recognize and manage potential life-threatening adverse reactions of glaucoma medications.
- Patient should be educated about eyelid closure and nasolacrimal occlusion when applying topical medications to reduce systemic absorption.
- The use of adjunctive antifibrosis agents in primary filtering surgery of phakic patients appears to yield lower intraocular pressure (IOP) measurements and to reduce the need for supplemental medical therapy, but it is associated with significant bleb-related complications, such as hypotony, hypotony maculopathy, late-onset bleb leak, and late-onset infection.
- Filtration surgery places the eye at risk for endophthalmitis for the duration of the patient's life.
- Compared with initial trabeculoplasty, there is an increased risk after repeat laser trabeculoplasty of problems and complications, such as IOP spikes.
- Because cyclodestructive surgical procedures have been associated with subsequent decrease of visual acuity, and, rarely, cases of sympathetic ophthalmia, they are often reserved for eyes with reduced visual acuity and patients who are poor candidates for incisional surgery. Disadvantages of cyclodestructive procedures include postoperative inflammation and the necessity for additional steps of treatment weeks or months later.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- *Preferred Practice Patterns* provide guidance for the pattern of practice, not for the care of a particular individual. While they should generally meet the needs of most patients, they cannot possibly best meet the needs of all patients. Adherence to these *Preferred Practice Patterns* will certainly not ensure a successful outcome in every situation. These practice patterns should not be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonable directed at obtaining the best results. It may be necessary to approach different patients' needs in different ways. The physician must make the ultimate judgment about the propriety of the care of a particular patient in light of all of the circumstances presented by that patient. The American Academy of Ophthalmology is available to assist members in resolving ethical dilemmas that arise in the course of ophthalmic practice.
- *Preferred Practice Patterns* are not medical standards to be adhered to in all individual situations. The Academy specifically disclaims any and all liability for injury or other damages of any kind, from negligence or otherwise, for any and all claims that may arise out of the use of any recommendations or other information contained herein.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Clinical Algorithm
Personal Digital Assistant (PDA) Downloads
Quick Reference Guides/Physician Guides

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Glaucoma Panel, Preferred Practice Patterns Committee. Primary open-angle glaucoma. San Francisco (CA): American Academy of Ophthalmology (AAO); 2005. 36 p. (Preferred practice pattern). [232 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1989 Sep (revised 2005)

GUIDELINE DEVELOPER(S)

American Academy of Ophthalmology - Medical Specialty Society

SOURCE(S) OF FUNDING

American Academy of Ophthalmology (AAO)

GUIDELINE COMMITTEE

Glaucoma Panel; Preferred Practice Patterns Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Glaucoma Panel Members: Douglas E. Gaasterland, MD (*Chair*); R. Rand Allingham, MD; Ronald L. Gross, MD; Henry D. Jampel, MD, American Glaucoma Society Representative; Young H. Kwon, MD, PhD; Bruce E. Prum, Jr., MD; Mae O. Gordon, PhD, Methodologist

Preferred Practice Patterns Committee Members: Sid Mandelbaum, MD (*Chair*); Emily Y. Chew, MD; Linda M. Christmann, MD; Douglas E. Gaasterland, MD; Stephen D. McLeod, MD; Samuel Masket, MD; Christopher J. Rapuano, MD; Donald S. Fong, MD, MPH, Methodologist

Academy Staff: Flora C. Lum, MD; Nancy Collins, RN, MPH; Doris Mizuiri

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

The following authors have received compensation within the past 3 years up to and including August 2005 for consulting services regarding the equipment, process, or product presented or competing equipment, process, or product presented:

Douglas E. Gaasterland, MD: IRIDEX -- Retainer.

Ronald L. Gross, MD: Alcon, Allergan, Ista, Merck, Pfizer -- Contract payments for research performed. Ad hoc consulting fees and reimbursement of travel

expenses. Reimbursement of travel expenses for presentation at meetings or courses.

Henry D. Jampel, MD: Alcon, Pfizer -- Contribution to research or research funds. Allergan – Financial interest in a company or companies supplying the equipment, process, or product presented. Pfizer -- Reimbursement of travel expenses for presentation at meetings or courses.

Bruce E. Prum, Jr., MD: Alcon -- Ad hoc consulting fees and reimbursement of travel expenses. Pfizer -- Contribution to research or research funds.

Other authors have no financial interest in the equipment, process, or product presented or competing equipment, process, or product presented.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: American Academy of Ophthalmology Glaucoma Panel, Preferred Practice Patterns Committee. Primary open-angle glaucoma. Limited revision. San Francisco (CA): American Academy of Ophthalmology (AAO); 2003. 37 p.

All Preferred Practice Patterns are reviewed by their parent panel annually or earlier if developments warrant and updated accordingly. To ensure that all Preferred Practice Patterns are current, each is valid for 5 years from the "approved by" date unless superseded by a revision.

GUIDELINE AVAILABILITY

Electronic copies: Available from the American Academy of Ophthalmology (AAO) Web site.

Print copies: Available from American Academy of Ophthalmology, P.O. Box 7424, San Francisco, CA 94120-7424; telephone, (415) 561-8540.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Summary benchmarks for preferred practice patterns. San Francisco (CA): American Academy of Ophthalmology; 2006 Nov. 21 p.

Available in Portable Document Format (PDF) from the American Academy of Ophthalmology (AAO) Web site.

Print copies: Available from American Academy of Ophthalmology, P.O. Box 7424, San Francisco, CA 94120-7424; telephone, (415) 561-8540.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on November 20, 2000. The information was verified by the guideline developer on December 20, 2000. This summary was updated on March 12, 2003 and again on April 9, 2004. The updated information was verified by the guideline developer on May 20, 2004. This NGC summary was updated by ECRI on January 9, 2006. The updated information was verified by the guideline developer on February 9, 2006.

COPYRIGHT STATEMENT

This NGC summary is based on the original guideline, which is subject to the guideline developer's copyright restrictions. Information about the content, ordering, and copyright permissions can be obtained by calling the American Academy of Ophthalmology at (415) 561-8500.

DISCLAIMER

NGC DISCLAIMER

The National Guideline Clearinghouse™ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion.aspx .

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.

© 1998-2008 National Guideline Clearinghouse

Date Modified: 9/15/2008