



Complete Summary

GUIDELINE TITLE

Idiopathic macular hole.

BIBLIOGRAPHIC SOURCE(S)

American Academy of Ophthalmology Retina/Vitreous Panel, Preferred Practice Patterns Committee. Idiopathic macular hole. San Francisco (CA): American Academy of Ophthalmology (AAO); 2008. 20 p. [151 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: American Academy of Ophthalmology Retina Panel, Preferred Practice Patterns Committee. Idiopathic macular hole. San Francisco (CA): American Academy of Ophthalmology (AAO); 2003. 17 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ensure that all Preferred Practice Patterns are current, each is valid for 5 years from the "approved by" date unless superseded by a revision.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)

Idiopathic macular hole

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Prevention
Risk Assessment
Treatment

CLINICAL SPECIALTY

Ophthalmology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To identify patients who might benefit from macular hole surgery, to inform these patients of the risks and benefits of such surgery, and to perform surgery and follow-up care in appropriate patients to maintain optimal central vision and vision-related quality of life, by addressing the following goals:

- Identify patients at risk for macular hole
- Educate high-risk patients about symptoms of macular hole and about the need for periodic follow-up
- Inform patients of the risks and benefits of macular hole surgery
- Manage patients who are at risk for visual loss from macular hole
- Maximize central vision recovery

TARGET POPULATION

Individuals with idiopathic macular holes

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

1. Comprehensive adult eye examination with complete history
2. Slit-lamp biomicroscopy
3. Ancillary tests, including optical coherence tomography

Treatment

1. Patient education about the natural history of the condition and risks, benefits, and alternatives to surgery
2. Observation, when indicated
3. Surgery, when indicated
4. Follow-up
5. Counseling and referral, as necessary

MAJOR OUTCOMES CONSIDERED

- Visual function (visual acuity)
- Effectiveness of therapy
 - Prevention of visual loss and functional impairment
 - Improvement of visual function
 - Maintenance of quality of life
- Closure rate (success rate)
- Rate of progression to full-thickness macular hole
- Complications of surgery
- Patient satisfaction

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

In the process of preparing this document, a detailed literature search of articles in the English language was conducted on the subject of macular hole for the years 2002 to 2007.

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 includes evidence obtained from at least one properly conducted, well-designed randomized, controlled trial. It could include meta-analyses of randomized controlled trials.

Level II includes evidence obtained from the following:

- Well-designed controlled trials without randomization
- Well-designed cohort or case-control analytic studies, preferably from more than one center
- Multiple-time series with or without the intervention

Level III includes evidence obtained from one of the following:

- Descriptive studies
- Case reports

- Reports of expert committees/organization (e.g., Preferred Practice Patterns [PPP] panel consensus with external peer review)

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 macular hole were reviewed by the Retinal 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, defined as most important

Level B, defined as moderately important

Level C, defined as relevant but not critical

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not 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 2008).

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

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

Diagnosis

The initial evaluation of a patient with symptoms and signs suggestive of macular hole includes all features of the comprehensive adult medical eye evaluation, with particular attention to those aspects relevant to macular hole (American Academy of Ophthalmology Preferred Practice Patterns Committee, 2005). Conditions often mistaken for the various stages of macular hole include cystoid macular edema, central serous retinopathy, a subfoveal druse, lamellar macular hole, epiretinal membrane with pseudohole, and solar maculopathy (Ho, Guyer, & Fine, 1998; Gass & Joondeph, 1990; Smiddy & Gass, 1995).

History

In general, a complete history includes the following items, although the exact composition varies with the patient's particular problems and needs.

- Duration of symptoms [A:III]
- Ocular history: glaucoma or other prior eye diseases, injuries, surgery, or other treatments, prolonged gazing at the sun [A:III]
- Medications that may be related to macular cysts (e.g., systemic niacin, topical prostaglandin analogues) [A:III]

Examination

- Slit-lamp biomicroscopy of the macula and the vitreoretinal interface [A:III]

Management

Management Recommendations for Macular Hole

Stage	Management	Follow-up [A:II]
1-A	Observation (de Bustros,1994) [A:II]	<ul style="list-style-type: none">• Prompt return if new symptoms• Every 4 to 6 months in the absence of symptoms
1-B	Observation (de Bustros,1994) [A:II]	<ul style="list-style-type: none">• Prompt return if new symptoms• Every 4 to 6 months in the absence of symptoms

Stage	Management	Follow-up [A:II]
2	Surgery (Kim et al.,1996) [A:II]*	<ul style="list-style-type: none"> • 1 to 2 days postoperatively, then 1 to 2 weeks • Frequency and timing of subsequent visits varies depending on the outcome of surgery and the patient's symptoms • If no surgery, every 4 to 8 months
3	Surgery (Kim et al.,1996; Freeman et al., 1997) [A:I]	<ul style="list-style-type: none"> • 1 to 2 days postoperatively, then 1 to 2 weeks • Frequency and timing of subsequent visits varies depending on the outcome of surgery and the patient's symptoms
4	Surgery (Kim et al., 1996; Freeman et al., 1997) [A:I]	<ul style="list-style-type: none"> • 1 to 2 days postoperatively, then 1 to 2 weeks • Frequency and timing of subsequent visits varies depending on the outcome of surgery and the patient's symptoms

*Although surgery is usually performed, observation is also appropriate.

The surgeon should inform the patient of the relative risks, benefits, and alternatives to surgery (American Academy of Ophthalmology, "Pretreatment Assessment," 2006; American Academy of Ophthalmology, " An Ophthalmologist's Duties," 2006), and, in particular, of the need for use of intraocular gas or special patient positioning postoperatively. [A:III] Patients with glaucoma should be informed of the possibility of a perioperative increase in intraocular pressure. [A:III] The surgeon is responsible for formulating a postoperative care plan and should inform the patient of these arrangements (American Academy of Ophthalmology, "Pretreatment Assessment," 2006; American Academy of Ophthalmology, "An Ophthalmologist's Duties," 2006). [A:III]

Follow-Up

Components of the follow-up examination should include the following:

- Interval history, including new symptoms [A:III]
- Measurement of intraocular pressure [A:III]
- Slit-lamp biomicroscopy of the retina and indirect binocular ophthalmoscopy to evaluate the peripheral retina [A:III]

Optical coherence tomography is helpful to document the macular anatomy.

Patients who have had a macular hole in one eye should be informed that there is a 10% to 15% chance over a period of 5 years of macular hole formation in the

fellow eye if no posterior vitreous detachment is present and a 2% chance if posterior vitreous detachment is present (Ezra et al., 1998; Akiba, Quiroz, & Trempe, 1990; Lewis et al., 1996; Fisher et al., 1994; Guyer et al., 1992; Chew et al., 1999). [A:III]

Counseling/Referral

Patients should be informed to notify their ophthalmologist promptly if they have symptoms such as an increase in floaters, a loss of visual field, or a decrease in visual acuity (Dayan et al., 1996; Byer, 1994; Smiddy et al., 1989). [A:II]
Patients should be informed that air travel, high altitudes, or general anesthesia with nitrous oxide should be avoided until the gas tamponade is nearly completely gone. [A:III] Vision rehabilitation restores functional ability (Stelmack et al., 2008) [A:I] and patients with functionally limiting postoperative visual impairment should be referred for vision rehabilitation and social services (American Academy of Ophthalmology Vision Rehabilitation Committee, 2007). [A:III] More information on vision rehabilitation, including materials for patients, is available at <http://www.aao.org/smartsight>.

Definitions:

Ratings of Importance to Care Process

Level A, defined as most important

Level B, defined as moderately important

Level C, defined as relevant but not critical

Ratings of Strength of Evidence

Level I includes evidence obtained from at least one properly conducted, well-designed randomized, controlled trial. It could include meta-analyses of randomized controlled trials.

Level II includes evidence obtained from the following:

- Well-designed controlled trials without randomization
- Well-designed cohort or case-control analytic studies, preferably from more than one center
- Multiple-time series with or without the intervention

Level III includes evidence obtained from one of the following:

- Descriptive studies
- Case reports
- Reports of expert committees/organization (e.g., Preferred Practice Patterns [PPP] panel consensus with external peer review)

CLINICAL ALGORITHM(S)

None provided

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 most recommendations (see "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Accurate diagnosis and appropriate management of idiopathic macular hole

POTENTIAL HARMS

Complications of Surgery

- *Cataract.* The 3-year incidence of significant cataract after surgery is at least 75%. Because of this high incidence, some surgeons have advocated combining macular hole surgery with phacoemulsification and placement of an intraocular lens. Such a procedure not only eliminates the need for two operations, but it may also allow a more complete gas fill. The potential complications of combining cataract surgery with vitrectomy include hypotony and intraocular lens iris capture, and it may increase the risk of macular edema in selected patients. Up to 10% of successfully closed macular holes later reopen. Reopening after cataract surgery has been reported, but most believe that uncomplicated cataract surgery does not increase the risk of reopening.
- *Retinal tears.* Intraoperative retinal tears, most commonly located inferiorly, have been reported in 3% to 17% of macular hole operations.
- *Retinal detachment.* Postoperative retinal detachment has been reported in up to 14% of cases, but most series report an incidence of 1% to 5%. The detachment is typically located inferiorly and caused by small flap tears at the posterior vitreous base. Fortunately, most detachments can be repaired without reopening of the hole.
- *Visual field loss.* Up to 20% of patients note permanent or temporal visual field loss after macular hole surgery, which may be caused by mechanical or dehydration injury to the retina from air streaming from the infusion cannula toward the retina during the air-fluid exchange. Visual field loss potentially can be reduced by secure closure of the sclerotomies to minimize air flow through the sclerotomies during the air-fluid exchange, by leaving a large puddle of fluid posteriorly until the final aspiration, by humidifying the air, or by using a low air pressure during air-fluid exchange.
- *Endophthalmitis.* Endophthalmitis has been reported in less than 0.05% of vitrectomies including after macular hole surgery.

- *Retinal tamponade.* Patients who have retinal tamponade achieved by an intravitreal gas bubble should avoid air travel, because bubble expansion at altitude causes increased intraocular pressure that could risk arterial occlusion.

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 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 reasonably 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 Pattern guidelines 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.
- References to certain drugs, instruments, and other products are made for illustrative purposes only and are not intended to constitute an endorsement of such. Such material may include information on applications that are not considered community standard, that reflect indications not included in approved Food and Drug Administration (FDA) labeling, or that are approved for use only in restricted research settings. The FDA has stated that it is the responsibility of the physician to determine the FDA status of each drug or device he or she wishes to use, and to use them with appropriate patient consent in compliance with applicable law.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

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

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

American Academy of Ophthalmology Retina/Vitreous Panel, Preferred Practice Patterns Committee. Idiopathic macular hole. San Francisco (CA): American Academy of Ophthalmology (AAO); 2008. 20 p. [151 references]

ADAPTATION

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

DATE RELEASED

2003 (revised 2008 Sep)

GUIDELINE DEVELOPER(S)

American Academy of Ophthalmology - Medical Specialty Society

SOURCE(S) OF FUNDING

American Academy of Ophthalmology without commercial support

GUIDELINE COMMITTEE

Retina/Vitreous Panel; Preferred Practice Patterns Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Members of the Retina/Vitreous Panel: Emily Y. Chew, MD, *Chair*, Macula Society and Retina Society Representative; William E. Benson, MD; Barbara A. Blodi, MD; H. Culver Boldt, MD; Timothy G. Murray, MD, Consultant and American Society of Retina Specialists Representative; Timothy W. Olsen, MD; Carl D. Regillo, MD, FACS; Ingrid U. Scott, MD, MPH; Leslie Hyman, PhD, Methodologist

Members of the Preferred Practice Patterns Committee: Sid Mandelbaum, MD, *Chair*; Emily Y. Chew, MD; Linda M. Christmann, MD; Douglas E. Gaasterland, MD; Samuel Masket, MD; Stephen D. McLeod, 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

These panel and committee members have disclosed the following financial relationships occurring from January 2007 to October 2008:

H. Culver Boldt, MD: Alcon Laboratories, Inc. – Consultant/Advisor

Donald S. Fong, MD, MPH: Merck – Consultant/Advisor

Douglas E. Gaasterland, MD: Inspire Pharmaceuticals – Consultant/Advisor; IRIDEX – Consultant/Advisor, Equity owner, Patents/Royalty

Samuel Masket, MD: Alcon Laboratories, Inc. – Consultant/Advisor, Lecture fees, Grant support; Allergan, Inc. – Lecture fees; Bausch & Lomb, Inc. – Lecture fees; Omeros Pharmaceuticals, Inc. – Consultant/Advisor; Othera Pharmaceuticals, Inc. – Consultant/Advisor; PowerVision – Consultant/Advisor; Visiogen, Inc. – Consultant/Advisor

Stephen D. McLeod, MD: Alcon Laboratories, Inc. – Consultant/Advisor, Grant support; InSite Vision, Inc. – Consultant/Advisor, Visiogen, Inc. – Consultant/Advisor, Equity owner, Grant support

Timothy W. Olsen, MD: iScience – Grant support; Powerscope, Inc. – Grant support

Christopher J. Rapuano, MD: Alcon Laboratories, Inc. – Lecture fees; Allergan, Inc. – Consultant/Advisor, Lecture fees; Inspire Pharmaceuticals – Lecture fees; Ista Pharmaceuticals – Lecture fees; Rapid Pathogen Screening – Equity/owner; Ziemer Ophthalmic Systems AG – Consultant/Advisor

Carl D. Regillo, MD, FACS: Alcon Laboratories, Inc. – Consultant/Advisor; Eyetech, Inc. – Consultant/Advisor, Grant support; Genentech, Inc. – Consultant/Advisor, Grant support; Novartis – Consultant/Advisor, Grant support; QLT Phototherapeutics, Inc. – Consultant/Advisor, Grant support

Ingrid U. Scott, MD, MPH: Eyetech, Inc. – Consultant/Advisor, Lecture fees; Genentech, Inc. – Consultant/Advisor, Lecture fees; Pfizer Ophthalmics – Consultant/Advisor, Lecture fees

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: American Academy of Ophthalmology Retina Panel, Preferred Practice Patterns Committee. Idiopathic macular hole. San Francisco (CA): American Academy of Ophthalmology (AAO); 2003. 17 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; Phone: (415) 561-8540.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Summary benchmarks for preferred practice patterns. San Francisco (CA): American Academy of Ophthalmology; 2008 Nov. 22 p.

Electronic copies: Available in Portable Document Format (PDF) or Personal Digital Assistant (PDA) format 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; Phone: (415) 561-8540.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on April 30, 2004. The information was verified by the guideline developer May 20, 2004. This NGC summary was updated by ECRI Institute on April 22, 2009. The updated information was verified by the guideline developer on May 15, 2009.

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.

[Copyright/Permission Requests](#)

Date Modified: 6/8/2009

