

SUMMARY BENCHMARKS FOR PREFERRED PRACTICE PATTERN® GUIDELINES Table of Contents

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SUMMARY BENCHMARKS FOR PREFERRED PRACTICE PATTERN® GUIDELINES

Introduction:

These are summary benchmarks for the Academy's Preferred Practice Pattern® (PPP) guidelines. The Preferred Practice Pattern series of guidelines has been written on the basis of three principles.

- Each Preferred Practice Pattern should be clinically relevant and specific enough to provide useful information to practitioners.
- Each recommendation that is made should be given an explicit rating that shows its importance to the care process.
- Each recommendation should also be given an explicit rating that shows the strength of evidence that supports the recommendation and reflects the best evidence available.

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.

The 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.

For each major disease condition, recommendations for the process of care, including the history, physical exam and ancillary tests, are summarized, along with major recommendations for the care management, follow-up, and education of the patient. For each PPP, a detailed

literature search of PubMed and the Cochrane Library for articles in the English language is conducted. The results are reviewed by an expert 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 ratings of importance are divided into three levels.

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

The panel also rated each recommendation on the strength of evidence in the available literature to support the recommendation made. The "ratings of strength of evidence" also are divided into three levels.

- 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/organizations (e.g., PPP panel consensus with external peer review)

PPPs are intended to serve as guides in patient care, with greatest emphasis on technical aspects. In applying this knowledge, it is essential to recognize that true medical excellence is achieved only when skills are applied in a such a manner that the patients' needs are the foremost consideration. The AAO is available to assist members in resolving ethical dilemmas that arise in the course of practice. (AAO Code of Ethics)

Primary Open-Angle Glaucoma (Initial Evaluation)

Initial Exam History (Key elements)

- Ocular history ^[A:III]
- Systemic history ^[A:III]
- Family history ^[A:II]
- Assessment of impact of visual function on daily living and activities ^[A:III]
- Review of pertinent records ^[A:III]

Initial Physical Exam (Key elements)

- Visual acuity ^[A:III]
- Pupils ^[B:II]
- Slit-lamp biomicroscopy of anterior segment ^[A:III]
- Measurement of IOP ^[A:I]
 - Time of day recorded because of diurnal variation ^[B:III]
- Central corneal thickness ^[A:II]
- Gonioscopy ^[A:III]
- Evaluation of optic nerve head and retinal nerve fiber layer with magnified stereoscopic visualization ^[A:III]
- Documentation of the optic disc morphology, best performed by color stereophotography or computer-based image analysis ^[A:II]
- Evaluation of the fundus (through a dilated pupil whenever feasible) ^[A:III]
- Visual field evaluation, preferably by automated static threshold perimetry ^[A:III]

Management Plan for Patients in Whom Therapy is Indicated

- Set an initial target pressure of at least 20% lower than pretreatment IOP, assuming that the measured pretreatment pressure range contributed to optic nerve damage. ^[A:I] The more advanced the damage, the lower the initial target pressure should be. ^[A:III]
- In many instances, topical medications constitute effective initial therapy. ^[A:III]
- Laser trabeculoplasty is an appropriate initial therapeutic alternative. ^[A:I]
- Filtering surgery may sometimes be an appropriate initial therapeutic alternative. ^[A:I]
- Choose a regimen of maximal effectiveness and tolerance to achieve desired therapeutic response. ^[A:III]

Surgery and Postoperative Care for Laser Trabeculoplasty Patients:

- Ensure the patient receives adequate postoperative care. ^[A:III] Plan prior to and after surgery includes:
 - Informed consent. ^[A:III]
 - At least one preoperative evaluation and IOP measurement by the surgeon. ^[A:III]
 - At least one IOP check within 30 to 120 minutes following surgery. ^[A:I]
 - Examine within 6 weeks of surgery or sooner if concerned about IOP-related optic nerve damage. ^[A:III]

Surgery and Postoperative Care for Filtering Surgery Patients:

- Ensure the patient receives adequate postoperative care. ^[A:III] Plan prior to and after surgery includes:
 - Informed consent. ^[A:III]
 - At least one preoperative evaluation by the surgeon. ^[A:III]
 - Follow-up on first day (12 to 36 hours after surgery) and at least once from the second to tenth postoperative day. ^[A:II]
 - In absence of complications, additional routine postoperative visits during a 6-week period. ^[A:III]
 - Use topical corticosteroids in the postoperative period, unless contraindicated. ^[A:II]
 - Add more frequent visits, if needed, for patients with postoperative complications. ^[A:III]
 - Additional treatments as necessary to maximize chances for long-term success. ^[A:III]

Patient Education For Patients with Medical Therapy:

- Discuss diagnosis, severity of the disease, prognosis and management plan, and likelihood that therapy will be lifelong. ^[A:III]
- Educate about eyelid closure or nasolacrimal occlusion when applying topical medications to reduce systemic absorption. ^[B:II]
- Encourage patients to alert their ophthalmologist to physical or emotional changes that occur when taking glaucoma medications. ^[A:III]
- Educate about the disease process, rationale and goals of intervention, status of their condition, and relative benefits and risks of alternative interventions so that patients can participate meaningfully in developing an appropriate plan of action. ^[A:III]

Primary Open-Angle Glaucoma (Follow-up Evaluation)

Exam History

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

Physical Exam

- Visual acuity ^[A:III]
- Slit-lamp biomicroscopy ^[A:III]
- Measurement of IOP and time of day of measurement ^[A:III]
- Evaluation of optic nerve and visual fields (see table below) ^[A:III]
- Pachymetry should be repeated after any event that may alter central corneal thickness. ^[A:II]

Management Plan For Patients On Medical Therapy:

- Reconsider current IOP and its relationship to the target IOP at each visit. ^[A:III]
- At each exam, record dosage and frequency of use, discuss adherence to the therapeutic regimen and patient's response to recommendations for therapeutic alternatives or diagnostic procedures. ^[A:III]

- Perform gonioscopy if there is a suspicion of angle closure, anterior-chamber shallowing or anterior-chamber angle abnormalities or if there is an unexplained change in IOP. ^[A:III] Perform gonioscopy periodically (e.g., 1-5 years). ^[A:III]
- Reassess treatment regimen if target IOP is not achieved and maintained in light of potential risks and benefits of additional or alternative treatment. ^[A:III]
- If a drug fails to reduce IOP, replace with an alternate agent until effective medical treatment is established. ^[A:III]
- Adjust target pressure downward if disc or visual field change is progressive. ^[A:III]
- Within each of the recommended intervals, factors that determine frequency of evaluation include the severity of damage, the stage of 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]
- Deleting or adding medication justifies a follow-up visit at an interval appropriate for washout or maximal effect of medication withdrawn or added. ^[A:III]

Patient Education For Patients with Medical Therapy:

- Encourage patients to alert their ophthalmologist to physical or emotional changes that occur when taking glaucoma medications. ^[A:III]
- Refer for or encourage patients with significant visual impairment or blindness to use appropriate vision rehabilitation and social services. ^[A:III]

Follow-Up:

Recommended Guidelines for Follow-up

Target IOP Achieved	Progression of Damage	Duration of Control (months)	Follow-up Interval ^[B:III]	Optic Nerve Head Evaluation ^[A:III]	Visual Field Evaluation ^[A:III]
Yes	No	≤6	within 6 months	3–12 months	3–12 months
Yes	No	>6	within 12 months	3–12 months	3–12 months
Yes	Yes	(n/a)	within 4 months	1–12 months	1–12 months
No	Yes or No	(n/a)	within 4 months	1–12 months	1–12 months

Primary Open-Angle Glaucoma Suspect (Initial and Follow-up Evaluation)

Initial Exam History (Key elements)

- Ocular history ^[A:III]
- Systemic history ^[A:III]
- Family history ^[A:III]
- Review of pertinent records ^[A:III]
- Assessment of impact of visual function on daily living and activities ^[A:III]

Initial Physical Exam (Key elements)

- Visual acuity ^[A:III]
- Pupils ^[B:II]
- Slit-lamp biomicroscopy of anterior segment ^[A:III]
- Measurement of IOP ^[A:I]
- Central corneal thickness ^[A:II]
- Gonioscopy ^[A:III]
- Evaluation of optic nerve head and retinal nerve fiber layer, with magnified stereoscopic visualization ^[A:III]
- Documentation of the optic disc morphology, best performed by color stereophotography or computer-based image analysis ^[A:III]
- Evaluation of the fundus (through a dilated pupil whenever feasible) ^[A:III]
- Visual field evaluation, preferably by automated static threshold perimetry ^[A:III]

Management Plan for Patients in Whom Therapy is Indicated:

- An appropriate initial goal is to set a target pressure 20% less than mean of several IOP measurements and ≤ 24 mmHg ^[A:I]
- Choose a regimen of maximal effectiveness and tolerance to achieve desired therapeutic response. ^[A:III]

Follow-up Exam History

- Interval ocular history ^[A:III]
- Interval systemic medical history and any change of systemic medications ^[B:III]
- Side effects of ocular medications if patient is being treated ^[A:III]
- Frequency and time of last glaucoma medications, and review of use, if patient is being treated ^[B:III]

Follow-up Physical Exam

- Visual acuity ^[A:III]
- Slit-lamp biomicroscopy ^[A:III]
- IOP and time of day of measurement ^[A:III]
- Gonioscopy is indicated when there is a suspicion of an angle-closure component, anterior chamber shallowing or unexplained change in IOP. ^[A:III]

Patient Education For Patients with Medical Therapy:

- Discuss number and severity of risk factors, prognosis, management plan and likelihood that therapy, once started, will be long term. ^[A:III]
- Educate about disease process, rationale and goals of intervention, status of their condition, and relative benefits and risks of alternative interventions ^[A:III]
- Educate about eyelid closure and nasolacrimal occlusion when applying topical medications to reduce systemic absorption. ^[B:II]
- Encourage patients to alert their ophthalmologist to physical or emotional changes that occur when taking glaucoma medications. ^[A:III]

Recommended Guidelines for Follow-up ^[A:III]

Treatment	Target IOP Achieved	High Risk of Damage	Follow-up Interval	Frequency of Optic Nerve Head and Visual Field Evaluation
No	N/A	No	6–24 months	6–24 months
No	N/A	Yes	3–12 months	6–18 months
Yes	Yes	Yes	3–12 months	6–18 months
Yes	No	Yes	≤ 4 months	3–12 months

Primary Angle Closure (Initial Evaluation and Therapy)

Initial Exam History (Key elements)

- Systemic history (e.g., use of topical or systemic medications) ^[A:III]
- Ocular history (symptoms suggestive of intermittent angle-closure attacks) ^[A:III]
- Family history of acute angle-closure glaucoma ^[B:II]

Initial Physical Exam (Key elements)

- Visual acuity ^[A:III]
- Refractive status ^[A:III]
- Pupils ^[A:III]
- External examination ^[A:III]
- Slit-lamp biomicroscopy ^[A:III]
 - Anterior chamber inflammation suggestive of a recent or current attack
 - Corneal edema
 - Central and peripheral anterior-chamber depth
 - Iris atrophy, particularly sector types, posterior synechiae or mid-dilated pupil.
 - Signs of previous angle closure attacks
- Measurement of IOP ^[A:III]
- Gonioscopy of both eyes ^[A:III]
- Evaluation of fundus and optic nerve head using direct ophthalmoscope or biomicroscope ^[A:III]

Diagnosis

- Establish a diagnosis of primary angle closure, excluding secondary forms. ^[A:III]

Management Plan for Patients in Whom Iridotomy is Indicated

- Treat acute PAC by laser iridotomy or incisional iridectomy if a laser iridotomy cannot be successfully performed. ^[A:III]
- In acute angle-closure attacks, usually use medical therapy first to lower the IOP, to reduce pain and clear corneal edema in preparation for iridotomy. ^[A:III]
- Perform prophylactic iridotomy in fellow eye if chamber angle is anatomically narrow. ^[A:III]
- Perform surgery on one eye at a time for patients requiring bilateral incisional iridectomy (several days apart) whenever feasible to avoid simultaneous bilateral complications. ^[A:III]

Surgery and Postoperative Care for Iridotomy Patients

- Ensure the patient receives adequate postoperative care. ^[A:III] Plan prior to and after surgery includes:
 - Informed consent ^[A:III]
 - At least one preoperative evaluation by the surgeon. ^[A:III]
 - At least one IOP check within 30 to 120 minutes following laser surgery. ^[A:III]
 - Use of topical anti-inflammatory agents in the postoperative period, unless contraindicated. ^[A:III]
- Follow-up evaluations include:
 - Evaluation of patency of iridotomy ^[A:III]
 - Measurement of IOP ^[A:III]
 - Gonioscopy, if not performed immediately after iridotomy ^[A:III]
 - Pupil dilation to reduce risk of posterior synechiae formation ^[A:III]
 - Fundus examination as clinically indicated ^[A:III]
- Use medications perioperatively to avert sudden IOP elevation, particularly in patients with severe disease. ^[A:III]
- Refer for and encourage patients with significant visual impairment or blindness to use vision rehabilitation and social services. ^[A:III]

Evaluation and Follow-Up of Patients with Iridotomy:

- After iridotomy, follow patients with glaucomatous optic neuropathy as specified in the Primary Open-Angle Glaucoma PPP. ^[A:III]
- Follow all other patients as specified in the Primary Open-Angle Glaucoma Suspect PPP. ^[A:III]

Education For Patients if Iridotomy is Not Performed:

- Inform patients at risk for acute angle closure about symptoms of acute angle-closure attacks and instruct them to notify immediately if symptoms occur. ^[A:III]
- Warn patients of danger of taking medicines that could cause pupil dilation and induce an angle-closure attack. ^[A:III]

Age-Related Macular Degeneration (Initial and Follow-up Evaluation)

Initial Exam History (Key elements)

- Symptoms (metamorphopsia, decreased vision) ^[A:II]
- Medications and nutritional supplements ^[B:III]
- Ocular history ^[B:III]
- Systemic history (any hypersensitivity reactions) ^[B:II]
- Family history, especially family history of AMD ^[B:II]
- Social history, especially smoking ^[B:II]

Initial Physical Exam (Key elements)

- Visual acuity ^[A:III]
- Stereo biomicroscopic examination of the macula ^[A:III]

Ancillary Tests

Intravenous fundus fluorescein angiography in the clinical setting of AMD is indicated: ^[A:I]

- when patient complains of new metamorphopsia
- when patient has unexplained blurred vision
- when clinical exam reveals elevation of the RPE or retina, subretinal blood, hard exudates or subretinal fibrosis
- to detect the presence of and determine the extent, type, size, and location of CNV and to calculate the percentage of the lesion composed of or consisting of classic CNV
- to guide treatment (laser photocoagulation surgery or verteporfin PDT)
- to detect persistent or recurrent CNV following treatment
- to assist in determining the cause of visual loss that is not explained by clinical exam

Each angiographic facility must have a care plan or an emergency plan and a protocol to minimize the risk and manage any complications. ^[A:III]

Follow-up Exam History

- Visual symptoms, including decreased vision and metamorphopsia ^[A:II]
- Changes in medications and nutritional supplements ^[B:III]
- Interval ocular history ^[B:III]
- Interval systemic history ^[B:III]
- Changes in social history, especially smoking ^[B:II]

Follow-up Physical Exam

- Visual acuity ^[A:III]
- Stereo biomicroscopic examination of the fundus ^[A:III]

Follow-up after Treatment for Neovascular AMD

- Discuss risks, benefits and complications with the patient and obtain informed consent ^[A:III]
- Examine patients treated with ranibizumab intravitreal injections approximately 4 weeks after treatment ^[A:III]
- Examine patients treated with bevacizumab intravitreal injections approximately 4 to 8 weeks after treatment ^[A:III]
- Examine patients treated with pegaptanib sodium injection approximately 6 weeks following the treatment ^[A:III]
- Examine and perform fluorescein angiography at least every 3 months for up to 2 years after verteporfin PDT ^[A:II]
- Examine patients treated with thermal laser photocoagulation approximately 2 to 4 weeks after treatment and then at 4 to 6 weeks ^[A:III]
- Optical coherence tomography, ^[A:III] fluorescein angiography, ^[A:I] and fundus photography ^[A:III] may be helpful to detect signs of exudation and should be used when clinically indicated
- Subsequent examinations should be performed as indicated depending on the clinical findings and the judgment of the treating ophthalmologist ^[A:III]

Patient Education

- Educate patients about the prognosis and potential value of treatment as appropriate for their ocular and functional status ^[A:III]
- Encourage patients with early AMD to have regular dilated eye exams for early detection of intermediate AMD ^[A:III]
- Educate patients with intermediate AMD about methods of detecting new symptoms of CNV and about the need for prompt notification to an ophthalmologist ^[A:III]
- Instruct patients with unilateral disease to monitor their vision in their fellow eye and to return periodically even in absence of symptoms, but promptly after onset of new or significant visual symptoms ^[A:III]
- Instruct patients to report symptoms suggestive of endophthalmitis, including eye pain or increased discomfort, worsening eye redness, blurred or decreased vision, increased sensitivity to light, or increased number of floaters promptly ^[A:III]
- Encourage patients who are currently smoking to stop ^[A:I] because there are observational data that support a causal relationship between smoking and AMD ^[A:II] and other considerable health benefits of smoking cessation
- Refer patients with reduced visual function for vision rehabilitation (see www.aao.org/smartsight) and social services ^[A:III]

Age-Related Macular Degeneration (Management Recommendations)

Treatment Recommendations and Follow-up Plans for Age-Related Macular Degeneration

Recommended Treatment	Diagnoses Eligible for Treatment	Follow-up Recommendations
Observation with no medical or surgical therapies ^[A-I]	No clinical signs of AMD (AREDS category 1) Early AMD (AREDS category 2) Advanced AMD with bilateral subfoveal geographic atrophy or disciform scars	As recommended in the Comprehensive Adult Medical Eye Evaluation PPP ^[A:III] Return exam at 6 to 24 months if asymptomatic or prompt exam for new symptoms suggestive of CNV ^[A:III] Return exam at 6 to 24 months if asymptomatic or prompt exam for new symptoms suggestive of CNV ^[A:III] No fundus photos or fluorescein angiography unless symptomatic ^[A-I]
Antioxidant vitamin and mineral supplements as recommended in the AREDS reports ^[A-I]	Intermediate AMD (AREDS category 3) Advanced AMD in one eye (AREDS category 4)	Monitoring of monocular near vision (reading/Amsler grid) ^[A:III] Return exam at 6 to 24 months if asymptomatic or prompt exam for new symptoms suggestive of CNV ^[A:III] Fundus photography as appropriate Fluorescein angiography if there is evidence of edema or other signs and symptoms of CNV
Ranibizumab intravitreal injection 0.5 mg as recommended in ranibizumab literature ^[A-I]	Subfoveal CNV	Patients should be instructed to report any symptoms suggestive of endophthalmitis promptly, including eye pain or increased discomfort, worsening eye redness, blurred or decreased vision, increased sensitivity to light, or increased number of floaters ^[A:III] Return exam approximately 4 weeks after treatment; subsequent follow-up depends on the clinical findings and judgment of the treating ophthalmologist ^[A:III] Monitoring of monocular near vision (reading/Amsler grid) ^[A:III]
Bevacizumab intravitreal injection as described in published reports ^[A:III] The ophthalmologist should provide appropriate informed consent with respect to the off-label status ^[A:III]	Subfoveal CNV	Patients should be instructed to report any symptoms suggestive of endophthalmitis promptly, including eye pain or increased discomfort, worsening eye redness, blurred or decreased vision, increased sensitivity to light, or increased number of floaters ^[A:III] Return exam approximately 4 to 8 weeks after treatment; subsequent follow-up depends on the clinical findings and judgment of the treating ophthalmologist ^[A:III] Monitoring of monocular near vision (reading/Amsler grid) ^[A:III]
Pegaptanib sodium 0.3 mg intravitreal injection as recommended in pegaptanib sodium literature ^[A-I]	Subfoveal CNV, new or recurrent, for predominantly classic lesions ≤ 12 MPS disc areas in size Minimally classic, or occult with no classic lesions where the entire lesion is ≤ 12 disc areas in size, subretinal hemorrhage associated with CNV comprises $\leq 50\%$ of lesion, and/or there is lipid present, and/or the patient has lost 15 or more letters of visual acuity during the previous 12 weeks	Patients should be instructed to report any symptoms suggestive of endophthalmitis promptly, including eye pain or increased discomfort, worsening eye redness, blurred or decreased vision, increased sensitivity to light, or increased number of floaters ^[A:III] Return exam with retreatments every 6 weeks as indicated ^[A:III] Monitoring of monocular near vision (reading/Amsler grid) ^[A:III]
PDT with verteporfin as recommended in the TAP and VIP reports ^[A-I]	Subfoveal CNV, new or recurrent, where the classic component is $>50\%$ of the lesion and the entire lesion is ≤ 5400 microns in greatest linear diameter Occult CNV may be considered for PDT with vision $<20/50$ or if the CNV is <4 MPS disc areas in size when the vision is $>20/50$	Return exam approximately every 3 months until stable, with retreatments as indicated ^[A:III] Monitoring of monocular near vision (reading/Amsler grid) ^[A:III]
Thermal laser photocoagulation surgery as recommended in the MPS reports ^[A-I]	Extrafoveal classic CNV, new or recurrent May be considered for juxtapapillary CNV	Return exam with fluorescein angiography approximately 2 to 4 weeks after treatment, and then at 4 to 6 weeks and thereafter depending on the clinical and angiographic findings ^[A:III] Retreatments as indicated Monitoring of monocular near vision (reading/Amsler grid) ^[A:III]

AMD = Age-Related Macular Degeneration; AREDS = Age-Related Eye Disease Study; CNV = choroidal neovascularization; MPS = Macular Photocoagulation Study; PDT = photodynamic therapy; TAP = Treatment of Age-Related Macular Degeneration with Photodynamic Therapy; VIP = Verteporfin in Photodynamic Therapy

Diabetic Retinopathy (Initial and Follow-up Evaluation)

Initial Exam History (Key elements)

- Duration of diabetes ^[A:I]
- Past glycemic control (hemoglobin A1c) ^[A:I]
- Medications ^[A:III]
- Systemic history (e.g., obesity, ^[A:III] renal disease, ^[A:II] systemic hypertension, ^[A:I] serum lipid levels, ^[A:III] pregnancy ^[A:I])
- Ocular history ^[A:III]

Initial Physical Exam (Key elements)

- Visual acuity ^[A:I]
- Measurement of IOP ^[A:III]
- Gonioscopy when indicated (for neovascularization of the iris or increased IOP) ^[A:III]
- Slit-lamp biomicroscopy ^[A:III]
- Dilated funduscopy including stereoscopic examination of the posterior pole ^[A:I]
- Examination of the peripheral retina and vitreous, best performed with indirect ophthalmoscopy or with slit-lamp biomicroscopy, combined with a contact lens ^[A:III]

Diagnosis

- Classify both eyes as to category and severity of diabetic retinopathy, with presence/absence of CSME. ^[A:III] Each category has an inherent risk for progression.

Follow-up History

- Visual symptoms ^[A:III]
- Systemic status (pregnancy, blood pressure, serum cholesterol, renal status) ^[A:III]
- Glycemic status (hemoglobin A1c) ^[A:I]

Follow-up Physical Exam

- Visual acuity ^[A:I]
- Measurement of IOP ^[A:III]
- Slit-lamp biomicroscopy with iris examination ^[A:II]
- Gonioscopy (if iris neovascularization is suspected or present or if intraocular pressure is increased) ^[A:II]
- Stereo examination of the posterior pole after dilation of the pupils ^[A:I]
- Examination of the peripheral retina and vitreous when indicated ^[A:II]

Ancillary Tests

- Fundus photography is seldom of value in cases of minimal diabetic retinopathy or when diabetic retinopathy is unchanged from the previous photographic appearance ^[A:III]
- Fundus photography may be useful for documenting significant progression of disease and response to treatment ^[B:III]
- Fluorescein angiography is used as a guide for treating CSME ^[A:I] and as a means of evaluating the cause(s) of unexplained decreased visual acuity. ^[A:III] Angiography can identify macular capillary nonperfusion ^[A:II] or sources of capillary leakage resulting in macular edema as possible explanations for visual loss.
- Fluorescein angiography is not routinely indicated as a part of the examination of patients with diabetes ^[A:III]
- Fluorescein angiography is not needed to diagnose CSME or PDR, both of which are diagnosed by means of the clinical exam

Patient Education

- Discuss results of exam and implications ^[A:II]
- Encourage patients with diabetes but without diabetic retinopathy to have annual dilated eye exams ^[A:II]
- Inform patients that effective treatment for diabetic retinopathy depends on timely intervention, despite good vision and no ocular symptoms ^[A:II]
- Educate patients about the importance of maintaining near-normal glucose levels and near-normal blood pressure and lowering serum lipid levels ^[A:III]
- Communicate with the attending physician, e.g., family physician, internist, or endocrinologist, regarding eye findings ^[A:III]
- Provide patients whose conditions fail to respond to surgery and for whom further treatment is unavailable with proper professional support and offer referral for counseling, rehabilitative, or social services as appropriate ^[A:III]
- Refer patients with reduced visual function for vision rehabilitation (see www.aao.org/smartsight) and social services ^[A:III]

Diabetic Retinopathy (Management Recommendations)

Management Recommendations for Patients with Diabetes

Severity of Retinopathy	Presence of CSME*	Follow-up (Months)	Panretinal Photocoagulation (Scatter) Laser	Fluorescein Angiography	Focal and/or Grid Laser†
1. Normal or minimal NPDR	No	12	No	No	No
2. Mild to moderate NPDR	No	6–12	No	No	No
	Yes	2–4	No	Usually	Usually*‡
3. Severe NPDR	No	2–4	Sometimes§	Rarely	No
	Yes	2–4	Sometimes§	Usually	Usually ¶
4. Non-high-risk PDR	No	2–4	Sometimes§	Rarely	No
	Yes	2–4	Sometimes§	Usually	Usually‡
5. High-risk PDR	No	2–4	Usually	Rarely	No
	Yes	2–4	Usually	Usually	Usually ¶
6. Inactive/involved PDR	No	6–12	No	No	Usually
	Yes	2–4	No	Usually	Usually

CSME = clinically significant macular edema; NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy

* Exceptions include: hypertension or fluid retention associated with heart failure, renal failure, pregnancy, or any other causes that may aggravate macular edema.

Deferral of photocoagulation for a brief period of medical treatment may be considered in these cases. Also, deferral of CSME treatment is an option when the center of the macula is not involved, visual acuity is excellent, close follow-up is possible, and the patient understands the risks.

† Adjunctive treatments that may be considered include intravitreal corticosteroids or anti-vascular endothelial growth factor agents (off-label use).

‡ Deferring focal photocoagulation for CSME is an option when the center of the macula is not involved, visual acuity is excellent, close follow-up is possible, and the patient understands the risks. However, initiation of treatment with focal photocoagulation should also be considered because although treatment with focal photocoagulation is less likely to improve the vision, it is more likely to stabilize the current visual acuity. Treatment of lesions close to the foveal avascular zone may result in damage to central vision and with time, such laser scars may expand and cause further vision deterioration. Closer follow-up may be necessary for macular edema that is not clinically significant.

§ Panretinal photocoagulation surgery may be considered as patients approach high-risk PDR. The benefit of early panretinal photocoagulation at the severe nonproliferative or worse stage of retinopathy is greater in patients with type 2 diabetes than in those with type 1. Treatment should be considered for patients with severe NPDR and type 2 diabetes. Other factors, such as poor compliance with follow-up, impending cataract extraction or pregnancy, and status of the fellow eye will help in determining the timing of the panretinal photocoagulation.

¶ Some experts feel that it is preferable to perform focal photocoagulation first, prior to panretinal photocoagulation, to minimize panretinal photocoagulation laser-induced exacerbation of the macular edema.

Idiopathic Macular Hole (Initial Evaluation and Therapy)

Initial Exam History (Key elements)

- 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 ^[A:III]

Initial Physical Exam (Key elements)

- Visual acuity ^[A:III]
- Slit-lamp biomicroscopic examination of the macula and the vitreoretinal interface ^[A:III]

Management Recommendations for Macular Hole

Stage	Management	Follow-up ^[A:III]
1-A	Observation ^[A:III]	Prompt return if new symptoms Every 4 to 6 months in the absence of symptoms
1-B	Observation ^[A:III]	Prompt return if new symptoms Every 4 to 6 months in the absence of symptoms
2	Surgery ^[A:II] *	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 ^[A:I]	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 ^[A:I]	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.

Surgical and Postoperative Care if Patient Receives Treatment

- Inform the patient about relative risks, benefits, and alternatives to surgery, and the need for use of expansile intraocular gas or special patient positioning postoperatively ^[A:III]
- Formulate a postoperative care plan and inform the patient of these arrangements ^[A:III]
- Inform patients with glaucoma of possible perioperative increase in IOP ^[A:III]
- Examine postoperatively within 1 or 2 days and again 1 to 2 weeks after surgery ^[A:III]

Patient Education

- Inform patients 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 ^[A:II]
- Inform patients that air travel, high altitudes, or general anesthesia with nitrous oxide should be avoided until the gas tamponade is nearly completely gone ^[A:III]
- Inform patients who have had a macular hole in one eye that they have a 10% to 20% chance of macular hole formation in the fellow eye, especially if the hyaloid remains attached ^[A:III]
- Refer patients with functionally limiting postoperative visual impairment for vision rehabilitation (see www.aa.org/smartsight) and social services ^[A:III]

Posterior Vitreous Detachment, Retinal Breaks and Lattice Degeneration (Initial and Follow-up Evaluation)

Initial Exam History (Key elements)

- Symptoms of PVD [A:I]
- Family history [A:III]
- Prior eye trauma [A:III]
- Myopia [A:II]
- History of ocular surgery including refractive lens exchange and cataract surgery [A:II]

Initial Physical Exam (Key elements)

- Examination of the vitreous for hemorrhage, detachment, and pigmented cells [A:III]
- Examination of the peripheral fundus with scleral depression [A:III] The preferred method of evaluating peripheral vitreoretinal pathology is with indirect ophthalmoscopy combined with scleral depression. [A:III]

Ancillary Tests

- Perform B-scan ultrasonography if peripheral retina cannot be evaluated. [A:II] If no abnormalities are found, frequent follow-up examinations are recommended. [A:III]

Surgical and Postoperative Care if Patient Receives Treatment:

- Inform patient about the relative risks, benefits, and alternatives to surgery [A:III]
- Formulate a postoperative care plan and inform patient of these arrangements [A:III]
- Advise patient to contact ophthalmologist promptly if they have a substantial change in symptoms such as new floaters or visual field loss [A:II]

Follow-up History

- Visual symptoms [A:I]
- Interval history of eye trauma or intraocular surgery [A:II]

Follow-up Physical Exam

- Visual acuity [A:III]
- Evaluation of the status of the vitreous, with attention to the presence of pigment, hemorrhage, or syneresis [A:II]
- Examination of the peripheral fundus with scleral depression [A:III]
- B-scan ultrasonography if the media are opaque [A:III]
- Patients who present with vitreous hemorrhage sufficient to obscure retinal details and a negative B-scan should be followed periodically. For eyes in which a retinal tear is suspected, a repeat B-scan should be performed within approximately 4 weeks of the initial examination. [A:III]

Patient Education

- Educate patients at high risk of developing retinal detachment about the symptoms of PVD and retinal detachment and the value of periodic follow-up exams [A:II]
- Instruct all patients at increased risk of retinal detachment to notify their ophthalmologist promptly if they have a substantial change in symptoms such as increase in floaters, loss of visual field, or decrease in visual acuity [A:III]

Care Management

Management Options

Type of Lesion	Treatment
Acute symptomatic horseshoe tears	Treat promptly [A:II]
Acute symptomatic operculated tears	Treatment may not be necessary [A:III]
Traumatic retinal breaks	Usually treated [A:III]
Asymptomatic horseshoe tears	Usually can be followed without treatment [A:III]
Asymptomatic operculated tears	Treatment is rarely recommended [A:III]
Asymptomatic atrophic round holes	Treatment is rarely recommended [A:III]
Asymptomatic lattice degeneration without holes	Not treated unless PVD causes a horseshoe tear [A:III]
Asymptomatic lattice degeneration with holes	Usually does not require treatment [A:III]
Asymptomatic dialyses	No consensus on treatment and insufficient evidence to guide management
Fellow eyes with atrophic holes, lattice degeneration, or asymptomatic horseshoe tears	No consensus on treatment and insufficient evidence to guide management

PVD = Posterior vitreous detachment

Cataract (Initial and Follow-up Evaluation)

Initial Exam History

- Symptoms [A:II]
- Ocular history [A:III]
- Systemic history [A:III]
- Assessment of visual functional status [A:II]

Initial Physical Exam

- Visual acuity with current correction [A:III]
- Measurement of BCVA (with refraction when indicated) [A:III]
- Ocular alignment and motility [A:III]
- Pupil reactivity and function [A:III]
- Measurement of IOP [A:III]
- External examination [A:III]
- Slit-lamp biomicroscopy [A:III]
- Evaluation of the fundus (through a dilated pupil) [A:III]
- Assessment of relevant aspects of general and mental health [B:III]

Care Management

- Treatment is indicated when visual function no longer meets the patient's needs and cataract surgery provides a reasonable likelihood of improvement. [A:II]
- Cataract removal is also indicated when there is evidence of lens-induced disease or when it is necessary to visualize the fundus in an eye that has the potential for sight. [A:III]
- Surgery should not be performed under the following circumstances: [A:III] Glasses or visual aids provide vision that meets the patient's needs; surgery will not improve visual function; the patient cannot safely undergo surgery because of coexisting medical or ocular conditions; appropriate postoperative care cannot be obtained.
- Indications for second eye surgery are the same as for the first eye. [A:II] (with consideration given to needs for binocular function)

Preoperative Care

Ophthalmologist who is to perform the surgery has the following responsibilities:

- Examine the patient preoperatively [A:III]
- Ensure that the evaluation accurately documents symptoms, findings and indications for treatment [A:III]

- Inform the patient about the risks, benefits and expected outcomes of surgery [A:III]
- Formulate surgical plan, including selection of an IOL [A:III]
- Review results of presurgical and diagnostic evaluations with the patient [A:III]
- Formulate postoperative plans and inform patient of arrangements [A:III]

Follow-up Evaluation

- High-risk patients should be seen within 24 hours of surgery. [A:III]
- Routine patients should be seen within 48 hours of surgery. [A:III]
- Frequency and timing of subsequent visits depend on refraction, visual function, and medical condition of the eye.
- More frequent follow-up usually necessary for high risk patients.
- Components of each postoperative exam should include:
 - Interval history, including new symptoms and use of postop medications. [A:III]
 - Patient's assessment of visual functional status. [A:III]
 - Assessment of visual function (visual acuity, pinhole testing). [A:III]
 - Measurement of IOP. [A:III]
 - Slit-lamp biomicroscopy. [A:III]

Nd:YAG Laser Capsulotomy

- Treatment is indicated when vision impaired by posterior capsular opacification does not meet the patient's functional needs or when it critically interferes with visualization of the fundus. [A:III]
- Educate about the symptoms of posterior vitreous detachment, retinal tears and detachment and need for immediate examination if these symptoms are noticed. [A:III]

Patient Education

- For patients who are functionally monocular, discuss special benefits and risks of surgery, including the risk of blindness. [A:III]

Bacterial Keratitis (Initial Evaluation)

Initial Exam History

- Ocular symptoms ^[A:III]
- Contact lens history ^[A:III]
- Review of other ocular history ^[A:III]
- Review of other medical problems and systemic medications ^[A:III]
- Current and recently used ocular medications ^[A:III]
- Medication allergies ^[A:III]

Initial Physical Exam

- Visual acuity ^[A:III]
- General appearance of patient ^[B:III]
- Facial examination ^[B:III]
- Eyelids and eyelid closure ^[A:III]
- Conjunctiva ^[A:III]
- Nasolacrimal apparatus ^[B:III]
- Corneal sensation ^[A:III]
- Slit-lamp biomicroscopy
 - Eyelid margins ^[A:III]
 - Conjunctiva ^[A:III]
 - Sclera ^[A:III]
 - Cornea ^[A:III]
 - Anterior chamber ^[A:III]
 - Anterior vitreous ^[A:III]
- Contralateral eye ^[A:III]

Diagnostic Tests

- Manage majority of community-acquired cases with empiric therapy and without smears or cultures. ^[A:III]
- Indications for smears and cultures:
 - Sight-threatening or severe keratitis of suspected microbial origin prior to initiating therapy. ^[A:III]
 - A large corneal infiltrate that extends to the middle to deep stroma. ^[A:III]
 - Chronic in nature. ^[A:III]
 - Unresponsive to broad spectrum antibiotic therapy. ^[A:III]
 - Clinical features suggestive of fungal, amoebic, or mycobacterial keratitis. ^[A:III]

- The hypopyon that occurs in eyes with bacterial keratitis is usually sterile, and aqueous or vitreous taps should not be performed unless there is a high suspicion of microbial endophthalmitis. ^[A:III]
- Corneal scrapings for culture should be inoculated directly onto appropriate culture media to maximize culture yield. ^[A:III] If this is not feasible, place specimens in transport media. ^[A:III] In either case, immediately incubate cultures or take promptly to the laboratory. ^[A:III]

Care Management

- Topical antibiotic eye drops are preferred method in most cases. ^[A:III]
- Use topical broad-spectrum antibiotics initially in the empiric treatment of presumed bacterial keratitis. ^[A:III]
- For central or severe keratitis (e.g., deep stromal involvement or an infiltrate larger than 2 mm with extensive suppuration), use a loading dose (e.g., every 5 to 15 minutes for the first 1 to 3 hours), followed by frequent applications (e.g., every 30 minutes to 1 hour around the clock). ^[A:III] For less severe keratitis, a regimen with less frequent dosing is appropriate. ^[A:III]
- Use systemic therapy for gonococcal keratitis. ^[A:III]
- In general, modify initial therapy when there is a lack of improvement or stabilization within 48 hours. ^[A:III]
- For patients treated with ocular topical corticosteroids at time of presentation of suspected bacterial keratitis, reduce or eliminate corticosteroids until infection has been controlled. ^[A:III]
- When the corneal infiltrate compromises the visual axis, may add topical corticosteroid therapy following at least 2 to 3 days of progressive improvement with treatment with topical antibiotics. ^[A:III] Continue topical antibiotics at high levels with gradual tapering. ^[A:III]
- Examine patients within 1 to 2 days after initiation of topical corticosteroid therapy. ^[A:III]

Bacterial Keratitis (Management Recommendations)

Follow-Up Evaluation

- Frequency depends on extent of disease, but follow severe cases initially at least daily until clinical improvement or stabilization is documented. ^[A:III]

Patient Education

- Inform patients with risk factors predisposing them to bacterial keratitis of their relative risk, the signs and symptoms of infection, and to consult an ophthalmologist promptly if they experience such warning signs or symptoms ^[A:III]

- Educate about the destructive nature of bacterial keratitis and need for strict compliance with therapy. ^[A:III]
- Discuss possibility of permanent visual loss and need for future visual rehabilitation. ^[A:III]
- Educate patients with contact lenses about increased risk of infection associated with contact lens, overnight wear, and importance of adherence to techniques to promote contact lens hygiene. ^[A:III]
- Refer patients with significant visual impairment or blindness for vision rehabilitation if they are not surgical candidates (see www.aao.org/smartsight). ^[A:III]

Antibiotic Therapy of Bacterial Keratitis ^[A:III]

Organism	Antibiotic	Topical Concentration	Subconjunctival Dose
No organism identified or multiple types of organisms	Cefazolin	50 mg/ml	100 mg in 0.5 ml
	Tobramycin or gentamicin	9–14 mg/ml	20 mg in 0.5 ml
	Fluoroquinolones*	Various [†]	
Gram-positive Cocci	Cefazolin	50 mg/ml	100 mg in 0.5 ml
	Vancomycin [‡]	15–50 mg/ml	25 mg in 0.5 ml
	Bacitracin [‡]	10,000 IU	
	Fluoroquinolones*	Various [†]	
Gram-negative Rods	Tobramycin or gentamicin	9–14 mg/ml	20 mg in 0.5 ml
	Ceftazidime	50 mg/ml	100 mg in 0.5 ml
	Fluoroquinolones	Various [†]	
Gram-negative Cocci [§]	Ceftriaxone	50 mg/ml	100 mg in 0.5 ml
	Ceftazidime	50 mg/ml	100 mg in 0.5 ml
	Fluoroquinolones	Various [†]	
Nontuberculous Mycobacteria	Amikacin	20–40 mg/ml	20 mg in 0.5 ml
	Clarithromycin	10 mg/ml	
	Azithromycin	10 mg/ml	
	Fluoroquinolones	Various [†]	
Nocardia	Sulfacetamide	100 mg/ml	
	Amikacin	20–40 mg/ml	20 mg in 0.5 ml
	Trimethoprim/ Sulfamethoxazole:		
	Trimethoprim	16 mg/ml	
	Sulfamethoxazole	80mg/ml	

* Fewer gram-positive cocci are resistant to gatifloxacin and moxifloxacin than other fluoroquinolones.

[†] Ciprofloxacin 3 mg/ml; gatifloxacin 3 mg/ml; levofloxacin 15 mg/ml; moxifloxacin 5 mg/ml; ofloxacin 3 mg/ml, all commercially available at these concentrations

[‡] For resistant *Enterococcus* and *Staphylococcus* species and penicillin allergy. Vancomycin and bacitracin have no gram-negative activity and should not be used as a single agent in empirically treating bacterial keratitis.

[§] Systemic therapy is necessary for suspected gonococcal infection.

^{||} Data from Chandra NS, Torres ME, Winthrop KL. Cluster of *Mycobacterium chelonae* keratitis cases following laser in-situ keratomileusis. *Am J Ophthalmol* 2001; 132:819–30.

Blepharitis (Initial and Follow-up Evaluation)

Initial Exam History

- Ocular symptoms and signs ^[A:III]
- Time of day when symptoms are worse ^[A:III]
- Duration of symptoms ^[A:III]
- Unilateral or bilateral presentation ^[A:III]
- Exacerbating conditions ^[A:III] (e.g., smoke, allergens, wind, contact lenses, low humidity, retinoids, diet and alcohol consumption, eye makeup)
- Symptoms related to systemic diseases ^[A:III] (e.g., rosacea, allergy)
- Current and previous systemic and topical medications ^[A:III]
- Recent exposure to an infected individual ^[C:III] (e.g., pediculosis)
- Ocular history (e.g., previous intraocular and eyelid surgery, local trauma, including mechanical, thermal, chemical, and radiation injury)
- Systemic history (e.g., dermatological diseases such as rosacea, atopic disease, and herpes zoster ophthalmicus)

Initial Physical Exam

- Visual acuity ^[A:III]
- External examination
 - Skin ^[A:III]
 - Eyelids ^[A:III]
- Slit-lamp biomicroscopy
 - Tear film ^[A:III]
 - Anterior eyelid margin ^[A:III]
 - Eyelashes ^[A:III]
 - Posterior eyelid margin ^[A:III]
 - Tarsal conjunctiva ^[A:III]
 - Bulbar conjunctiva ^[A:III]
 - Cornea ^[A:III]
- Measurement of IOP ^[A:III]

Diagnostic Tests

- Cultures may be indicated for patients with recurrent anterior blepharitis with severe inflammation as well as for patients who are not responding to therapy. ^[A:III]
- Biopsy of the eyelid to exclude the possibility of carcinoma may be indicated in cases of marked asymmetry, resistance to therapy or unifocal recurrent chalazia that do not respond well to therapy. ^[A:II]
- Consult with the pathologist prior to obtaining the biopsy if sebaceous cell carcinoma is suspected. ^[A:III]

Care Management

- Treat patients with blepharitis initially with a regimen of warm compresses and eyelid hygiene. ^[A:III]
- For patients with staphylococcal blepharitis, a topical antibiotic such as bacitracin or erythromycin can be prescribed to be applied one or more times daily or at bedtime on the eyelids for one or more weeks. ^[A:III]
- For patients with meibomian gland dysfunction, whose chronic symptoms and signs are not adequately controlled with eyelid hygiene, oral tetracyclines can be prescribed. ^[A:III]
- A brief course of topical corticosteroids may be helpful for eyelid or ocular surface inflammation. The minimal effective dose of corticosteroid should be utilized and long-term corticosteroid therapy should be avoided if possible. ^[A:III]

Follow-Up Evaluation

- Follow-up visits should include:
 - Interval history ^[A:III]
 - Visual acuity ^[A:III]
 - External exam ^[A:III]
 - Slit-lamp biomicroscopy ^[A:III]
- If corticosteroid therapy is prescribed, re-evaluate patient within a few weeks to determine the response to therapy, measure intraocular pressure, and assess treatment compliance ^[A:III]

Patient Education

- Counsel patients about the chronicity and recurrence of the disease process. ^[A:III]
- Inform patients that symptoms can frequently be improved but are rarely eliminated. ^[A:III]
- Advise patient that if warm compress and eyelid hygiene treatment is effective, symptoms often recur if treatment is stopped so may be necessary long term ^[A:III]

Conjunctivitis (Initial Evaluation and Therapy)

Initial Exam History

- Ocular symptoms and signs (e.g., itching, discharge, irritation, pain, photophobia, blurred vision) ^[A:III]
- Duration of symptoms ^[A:III]
- Exacerbating factors ^[A:III]
- Unilateral or bilateral presentation ^[A:III]
- Character of discharge ^[A:III]
- Recent exposure to an infected individual ^[A:III]
- Trauma (mechanical, chemical, ultraviolet) ^[A:III]
- Contact lens wear (e.g., lens type, hygiene and use regimen) ^[A:III]
- Symptoms and signs potentially related to systemic diseases (e.g., genitourinary discharge, dysuria, upper respiratory infection, skin and mucosal lesions) ^[A:III]
- Allergy, asthma, eczema ^[A:III]
- Use of topical and systemic medications ^[A:III]
- Ocular history (e.g., previous episodes of conjunctivitis ^[A:III] and previous ophthalmic surgery ^[B:III])
- Systemic history (e.g., compromised immune status, current and prior systemic diseases ^[B:III])
- Social history (e.g., smoking, ^[C:III] occupation and hobbies, ^[C:III] travel ^[C:III] and sexual activity ^[C:III])

Initial Physical Exam

- Visual acuity ^[A:III]
- External examination
 - Regional lymphadenopathy (particularly preauricular) ^[A:III]
 - Skin ^[A:III]
 - Abnormalities of the eyelids and adnexae ^[A:III]
 - Conjunctiva ^[A:III]
- Slit-lamp biomicroscopy
 - Eyelid margins ^[A:III]
 - Eyelashes ^[A:III]
 - Lacrimal puncta and canaliculi ^[B:III]
 - Tarsal and forniceal conjunctiva ^[A:III]
 - Bulbar conjunctiva/limbus ^[A:III]
 - Cornea ^[A:I]
 - Anterior chamber/iris ^[A:III]
 - Dye-staining pattern ^[A:III] (conjunctiva and cornea)

Diagnostic Tests

- Cultures, smears for cytology and special stains are indicated in cases of suspected infectious neonatal conjunctivitis. ^[A:I]
- Smears for cytology and special stains are recommended in cases of suspected gonococcal conjunctivitis. ^[A:II]
- Confirm diagnosis of adult and neonate chlamydial conjunctivitis with immunodiagnostic test and/or culture. ^[A:III]

- Biopsy the bulbar conjunctiva and take a sample from an uninvolved area adjacent to the limbus in an eye with active inflammation when ocular mucous membrane pemphigoid is suspected. ^[A:III]
- A full-thickness lid biopsy is indicated in cases of suspected sebaceous carcinoma. ^[A:II]

Care Management

- Avoid indiscriminate use of topical antibiotics or corticosteroids because antibiotics can induce toxicity and corticosteroids can prolong adenoviral infections and worsen herpes simplex virus infections ^[A:III]
- Treat mild allergic conjunctivitis with an over-the-counter antihistamine/vasoconstrictor agent or second-generation topical histamine H1-receptor antagonists. ^[A:I] If the condition is frequently recurrent or persistent, use mast-cell stabilizers ^[A:I]
- For contact lens-related keratoconjunctivitis, discontinue contact lens wear for 2 or more weeks ^[A:III]
- If corticosteroids are indicated, prescribe the minimal amount based on patient response and tolerance ^[A:III]
- If corticosteroids are used, perform baseline measurement of intraocular pressure ^[A:III]
- Use systemic antibiotic treatment for conjunctivitis due to *Neisseria gonorrhoeae* ^[A:I] or *Chlamydia trachomatis*. ^[A:II]
- Treat sexual partners to minimize recurrence and spread of disease when conjunctivitis is associated with sexually transmitted diseases and refer patients and their sexual partners to an appropriate medical specialist. ^[A:III]
- Refer patients with manifestation of a systemic disease to an appropriate medical specialist. ^[A:III]

Follow-Up Evaluation

- Follow-up visits should include
 - Interval history ^[A:III]
 - Visual acuity ^[A:III]
 - Slit-lamp biomicroscopy ^[A:III]
- If corticosteroids are used, perform periodic measurement of intraocular pressure and pupillary dilation to evaluate for cataract and glaucoma ^[A:III]

Patient Education

- Counsel patients with contagious varieties to minimize or prevent spread of diseases in the community. ^[A:III]
- Inform patients who may require repeat short-term therapy with topical corticosteroid of potential complications of corticosteroid use ^[A:III]
- Advise patients with allergic conjunctivitis that frequent clothes washing and bathing/showering before bedtime may be helpful ^[B:III]

Dry Eye Syndrome (Initial Evaluation)

Initial Exam History

- Ocular symptoms and signs ^[A:III]
- Exacerbating conditions ^[B:III]
- Duration of symptoms ^[A:III]
- Topical medications used and their effect on symptoms ^[A:III]
- Ocular history, including
 - Contact lens wear, schedule and care ^[A:III]
 - Allergic conjunctivitis ^[A:III]
 - Ocular surgical history ^[A:III] (prior keratoplasty, cataract surgery, keratorefractive surgery)
 - Ocular surface disease ^[A:III] (e.g., herpes simplex virus, varicella zoster virus, ocular mucous membrane pemphigoid, Stevens-Johnson syndrome, aniridia, graft-versus-host disease)
 - Punctal surgery ^[A:III]
 - Eyelid surgery ^[A:III] (e.g. prior ptosis repair, blepharoplasty, entropion/ectropion repair)
 - Bell palsy ^[A:III]
- Systemic history, including
 - Smoking or exposure to second-hand smoke ^[A:III]
 - Dermatological diseases ^[A:III] (e.g., rosacea)
 - Technique and frequency of facial washing including eyelid and eyelash hygiene ^[A:III]
 - Atopy ^[A:III]
 - Menopause ^[A:III]
 - Systemic inflammatory diseases ^[A:III] (e.g., Sjögren syndrome, graft-versus-host disease, rheumatoid arthritis, systemic lupus erythematosus, scleroderma)
 - Other systemic conditions ^[A:III] (e.g., lymphoma, sarcoidosis)
 - Systemic medications ^[A:III] (e.g., antihistamines, diuretics, hormones and hormonal antagonists, antidepressants, cardiac antiarrhythmic drugs, isotretinoin, diphenoxylate/atropine, beta-adrenergic antagonists, chemotherapy agents, any other drug with anticholinergic effects)
 - Trauma ^[B:III] (e.g., chemical)
 - Chronic viral infections ^[B:III] (e.g., hepatitis C, human immunodeficiency virus)
 - Nonocular surgery ^[B:III] (e.g., bone marrow transplant, head and neck surgery, trigeminal neuralgia surgery)
 - Radiation of orbit ^[B:III]
 - Neurological conditions ^[B:III] (e.g., Parkinson disease, Bell palsy, Riley-Day syndrome, trigeminal neuralgia)
 - Dry mouth, dental cavities, oral ulcers ^[B:III]

Initial Physical Exam

- Visual acuity ^[A:III]
- External examination
 - Skin ^[A:III]
 - Eyelids ^[A:III]
 - Adnexae ^[A:III]
 - Proptosis ^[B:III]
 - Cranial nerve function ^[A:III]
 - Hands ^[B:III]
- Slit-lamp biomicroscopy
 - Tear film ^[A:III]
 - Eyelashes ^[A:III]
 - Anterior and posterior eyelid margins ^[A:III]
 - Puncta ^[A:III]
 - Inferior fornix and tarsal conjunctiva ^[A:III]
 - Bulbar conjunctiva ^[A:III]
 - Cornea ^[A:III]

Dry Eye Syndrome (Management Recommendations)

Care Management

- Treat any causative factors that are amenable to treatment as patients with dry eye symptoms often have many contributory factors ^[A:III]
- Sequence and combination of therapies is determined based on the patient's needs and preferences and the treating ophthalmologist's medical judgment ^[A:III]
- For mild dry eye, the following measures are appropriate:
 - Education and environmental modifications ^[A:III]
 - Elimination of offending topical or systemic medications ^[A:III]
 - Aqueous enhancement using artificial tear substitutes, gels/ointments ^[A:III]
 - Eyelid therapy (warm compresses and eyelid hygiene) ^[A:III]
 - Treatment of contributing ocular factors such as blepharitis or meibomianitis ^[A:III]
- For moderate dry eye, in addition to above treatments, the following measures are appropriate:
 - Anti-inflammatory agents (topical cyclosporine ^[A:I] and corticosteroids, ^[A:III] systemic omega-3 fatty acids supplements ^[A:III])
 - Punctal plugs ^[A:III]
 - Spectacle side shields and moisture chambers ^[A:III]
- For severe dry eye, in addition to above treatments, the following measures are appropriate:
 - Systemic cholinergic agonists ^[A:I]
 - Systemic anti-inflammatory agents ^[A:III]
 - Mucolytic agents ^[A:III]
 - Autologous serum tears ^[A:III]
 - Contact lenses ^[A:III]
 - Correction of eyelid abnormalities ^[A:III]
 - Permanent punctal occlusion ^[A:III]
 - Tarsorrhaphy ^[A:III]
- Monitor patients prescribed corticosteroids for adverse effects such as increased intraocular pressure, corneal melting, and cataract formation ^[A:III]

Patient Education

- Counsel patients about the chronic nature of dry eye and its natural history. ^[A:III]
- Provide specific instructions for therapeutic regimens. ^[A:III]
- Reassess periodically the patient's compliance and understanding of the disease, risks for associated structural changes and realistic expectations for effective management, and reinforce education. ^[A:III]
- Refer patients with manifestation of a systemic disease to an appropriate medical specialist. ^[A:III]
- Caution patients with pre-existing dry eye that keratorefractive surgery may worsen their dry eye condition. ^[A:III]

Amblyopia (Initial and Follow-up Evaluation)

Initial Exam History (Key elements)

- Ocular symptoms and signs ^[A:III]
- Ocular history ^[A:III]
- Systemic history, including review of prenatal, perinatal, and postnatal medical factors ^[A:III]
- Family history, including eye conditions and relevant systemic diseases ^[A:III]

Initial Physical Exam (Key elements)

- Assessment of visual acuity and fixation pattern ^[A:III]
- Ocular alignment and motility ^[A:III]
- Red reflex or binocular red reflex (Brückner) test ^[A:III]
- Pupil examination ^[A:III]
- External examination ^[A:III]
- Anterior segment examination ^[A:III]
- Cycloplegic retinoscopy/refraction ^[A:III]
- Funduscopy examination ^[A:III]
- Binocularity/stereoacuity testing ^[A:III]

Care Management

- Choose treatment based on patient's age; visual acuity; compliance with previous treatment; and physical, social, and psychological status. ^[A:III]
- Treatment goal is to achieve equalization/normalization of fixation patterns or visual acuity. ^[A:III]
- Once maximal visual acuity has been obtained, treatment should be tapered and eventually stopped. ^[A:III]

Follow-Up Evaluation

- Follow-up visits should include:
 - Interval history ^[A:III]
 - Tolerance to therapy ^[A:III]
 - Examinations and testing as indicated ^[A:III]

Amblyopia Follow-Up Evaluation Intervals During Active Treatment Period ^[A:III]

Age (years)	High-Percentage Occlusion (70% or more of waking hours/ ≥6 hours per day)	Low-Percentage Occlusion (<70% of waking hours/ <6 hours per day) or Penalization	Maintenance Treatment or Observation
0-1	1-4 weeks	2-8 weeks	1-4 months
1-2	2-8 weeks	2-4 months	2-4 months
2-3	3-12 weeks	2-4 months	2-4 months
3-4	4-16 weeks	2-6 months	2-6 months
4-5	4-16 weeks	2-6 months	2-6 months
5-7	6-16 weeks	2-6 months	2-6 months
7-9	8-16 weeks	3-6 months	3-12 months

Patient Education

- Discuss diagnosis, severity of disease, prognosis and treatment plan with patient, parents and/or caregivers. ^[A:III]
- Explain the disorder and recruit the family in a collaborative approach to therapy. ^[A:III]

Esotropia (Initial and Follow-up Evaluation)

Initial Exam History (Key elements)

- Ocular symptoms and signs [A:III]
- Ocular history (date of onset and frequency of the deviation, presence or absence of diplopia) [A:III]
- Systemic history (review of prenatal, perinatal and postnatal medical factors) [A:III]
- Family history, including presence of strabismus, amblyopia, extraocular muscle surgery, genetic diseases. [A:III]

Initial Physical Exam (Key elements)

- Visual acuity [A:III]
- Ocular alignment (at distance and near) and motility [A:III]
- Extraocular muscle function [A:III]
- Detection of nystagmus [A:III]
- Sensory testing [A:III]
- Cycloplegic retinoscopy/refraction [A:III]
- Fundoscopic examination [A:III]

Care Management

- Consider all forms of esotropia for treatment and re-establish ocular alignment promptly [A:III]
- Prescribe corrective lenses for any clinically significant refractive error [A:I]
- If optical correction does not align the eyes, then surgical correction is indicated [A:III]
- Start amblyopia treatment before surgery to reduce angle of strabismus or increase likelihood of binocularity [A:III]

Follow-Up Evaluation

- Periodic evaluations necessary until visual maturity reached [A:III]
- Hyperopia should be assessed every 1 to 2 years [A:III]
- More frequent cycloplegic examinations are indicated in cases with changes in acuity, amblyopia, or unstable alignment [A:III]
- If the examination has been stable, follow-up evaluations are appropriate every 1 to 2 years during teenage years [A:I]

Esotropia Follow-up Evaluation Intervals [A:III]

Age (years)	Interval (months)
0–1	3–6
1–5	6–12
5	12–24

Note: More frequent visits may be necessary if amblyopia is present or if there is a recent deterioration of alignment.

Patient Education

- Discuss findings with the patient when appropriate and/or parents/caregivers to enhance understanding of disorder and to recruit them in a collaborative approach to therapy. [A:III]
- Formulate treatment plans in consultation with the patient and/or family/caregivers. [A:III]

Exotropia (Initial and Follow-up Evaluation)

Initial Exam History (Key elements)

- Ocular symptoms and signs [A:III]
- Ocular history (date of onset and frequency of the deviation, presence or absence of diplopia) [A:III]
- Systemic history (review of prenatal, perinatal and postnatal medical factors) [A:III]
- Family history, including presence of strabismus, amblyopia, extraocular muscle surgery, genetic diseases. [A:III]

Initial Physical Exam (Key elements)

- Visual acuity [A:III]
- Ocular alignment (at distance and near) and motility [A:III]
- Extraocular muscle function [A:III]
- Detection of nystagmus [A:III]
- Sensory testing [A:III]
- Cycloplegic retinoscopy/refraction [A:III]
- Fundoscopic examination [A:III]

Care Management

- Consider all forms of exotropia for treatment and re-establish ocular alignment as soon as possible if deviation is manifest a large percentage of the time. [A:III]
- Prescribe corrective lenses for any clinically significant refractive error. [A:III]
- Optimal modes of therapy are not well established.

Follow-up Evaluation

- Periodic evaluations necessary until visual maturity reached [A:III]
- Intervals are reduced if strabismus is stable [A:III]
- Includes interval history, tolerance to treatment (if any), and routine examination and testing of ocular motility [A:III]

Exotropia Follow-up Evaluation Intervals [A:III]

Age (years)	Interval (months)
0–1	3–6
1–5	6–12
5	12–24

Note: More frequent visits may be necessary if patching therapy is being administered, or if there is a recent deterioration of alignment.

Patient Education

- Discuss findings with the patient when appropriate and/or parents/caregivers to enhance understanding of disorder and recruit them in a collaborative approach to therapy. [A:III]
- Formulate treatment plans in consultation with the patient and/or family/caregivers. [A:III]

Keratorefractive Surgery (Initial and Follow-up Evaluation)

Initial Exam History

- Present status of visual function [A:III]
- Ocular history [A:III]
- Systemic history [A:III]
- Medications [A:III]

Initial Physical Exam

- Visual acuity without correction [A:III]
- Manifest, and where appropriate, cycloplegic refraction [A:III]
- Computerized corneal topography [A:III]
- Central corneal thickness measurement [A:III]
- Evaluation of tear film [A:III]
- Evaluation of ocular motility and alignment [A:III]

Care Management

- Discontinue contact lenses before preoperative exam and procedure [A:III]
- Inform patient of the potential risks, benefits, and alternatives to and among the different refractive procedures [A:III]
- Document informed consent process; patient should be given an opportunity to have all questions answered before surgery [A:III]
- For LASIK, residual stromal bed thickness should not be less than 250 μm [A:III]
- Check and calibrate instrumentation before the procedure [A:III]
- Surgeon confirms the identity of the patient, the operative eye, and that the parameters are correctly entered into the excimer laser's computer [A:III]

Postoperative Care

- Operating surgeon is responsible for postoperative management [A:III]
- For surface ablation techniques, examine on the day following surgery and every 2 to 3 days thereafter until the epithelium is healed [A:III]
- For uncomplicated LASIK, examine within 48 hours following surgery, a second visit 1 to 4 weeks postoperatively, and further visits thereafter as appropriate [A:III]

Patient Education

Discuss the risks and benefits of the planned procedure with the patient. [A:III] Elements of the discussion include the following:

- Range of expected refractive outcomes
- Residual refractive error
- Reading and/or distance correction postoperatively
- Loss of best-corrected visual acuity
- Side effects and complications (e.g., microbial keratitis, sterile keratitis, keratectasia)
- Changes in visual function not necessarily measured by Snellen acuity, including glare and function under low-light conditions
- Night vision symptoms (e.g., glare, haloes) developing or worsening; careful consideration should be given to this issue for patients with high degrees of ametropia or for individuals who require a high level of visual function in low-light conditions
- Effect on ocular alignment
- Dry eye symptoms developing or worsening
- Monovision advantages and disadvantages (for patients of presbyopic age)
- Conventional and wavefront-guided ablations advantages and disadvantages
- Advantages and disadvantages of same-day bilateral keratorefractive surgery versus sequential surgery. Because vision might be poor for some time after bilateral same-day photorefractive keratectomy, the patient should be informed that activities such as driving might not be possible for weeks.
- Postoperative care plans (setting of care, providers of care)