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 are then given a rating that shows the strength of evidence when sufficient evidence exists.

To rate individual studies, a scale based on the Scottish Intercollegiate Guideline Network (SIGN) is used. The definitions and levels of evidence to rate individual studies are as follows:

- I++: High-quality meta-analyses, systematic reviews of randomized controlled trials (RCTs), or RCTs with a very low risk of bias
- I+: Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
- I–: Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias
- II++: High-quality systematic reviews of case-control or cohort studies; high-quality case-control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
- II+: Well-conducted case-control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
- II–: Case-control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
- III: Nonanalytic studies (e.g., case reports, case series)

Recommendations for care are formed based on the body of the evidence. The body of evidence quality ratings are defined by Grading of Recommendations Assessment, Development and Evaluation (GRADE) as follows:

- Good quality (GQ): Further research is very unlikely to change our confidence in the estimate of effect
- Moderate quality (MQ): Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate
- Insufficient quality (IQ): Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate; any estimate of effect is very uncertain

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Key recommendations for care are defined by GRADE as follows:

- Strong recommendation (SR): Used when the desirable effects of an intervention clearly outweigh the undesirable effects or clearly do not
- Discretionary recommendation (DR): Used when the trade-offs are less certain—either because of low-quality evidence or because evidence suggests that desirable and undesirable effects are closely balanced

In PPPs prior to 2011, the panel rated recommendations 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)

This former approach, however, will eventually be phased out as the AAO adopted the SIGN and GRADE rating and grading systems.

The 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)

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

Initial Exam History (Key elements)

- Symptoms (metamorphopsia, decreased vision, scotoma, photopsia, difficulties in dark adaptation) *(II–, GQ, SR)*
- Medications and nutritional supplements *(II+, GQ, SR)*
- Ocular history *(II+, GQ, SR)*
- Systemic history (any hypersensitivity reactions)
- Family history, especially family history of AMD *(II+, GQ, SR)*
- Social history, especially smoking *(III, GQ, SR)*

Initial Physical Exam (Key elements)

- Comprehensive eye examination *(II++, GQ, SR)*
- Stereo biomicroscopic examination of the macula *(III, GQ, SR)*

Diagnostic Tests

Optical coherence tomography is important in diagnosing and managing AMD, particularly with respect to determining the presence of subretinal fluid and in documenting the degree of retinal thickening. *(III, GQ, SR)* Optical coherence tomography defines the cross sectional architecture of the retina in a manner that is not possible with any other imaging technology. It may reveal the presence of fluid that is not apparent on biomicroscopy alone. It also assists in evaluating the response of the retina and RPE to therapy by allowing structural changes to be followed accurately. *(II+, GQ, SR)*

Intravenous fundus fluorescein angiography in the clinical setting of AMD is indicated:

- 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 *(II–, GQ, SR)*
- 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 *(III, IQ, DR)*
- to guide treatment (laser photocoagulation surgery or verteporfin PDT) *(III, IQ, DR)*
- to detect persistent or recurrent CNV following treatment *(III, IQ, DR)*
- to assist in determining the cause of visual loss that is not explained by clinical exam *(III, IQ, DR)*

Each angiographic facility must have a care plan or an emergency plan and a protocol to minimize the risk and manage any complications. *(III, GQ, SR)*

Follow-up Exam History

- Visual symptoms, including decreased vision and metamorphopsia *(II–, GQ, SR)*
- Changes in medications and nutritional supplements *(III, GQ, SR)*
- Changes in ocular history and systemic history *(II+, GQ, SR)*
- Changes in social history, especially smoking *(III, GQ, SR)*

Follow-up Physical Exam

- Visual acuity *(III, GQ, SR)*
- Stereo biomicroscopic examination of the fundus *(III, GQ, SR)*

Follow-up after Treatment for Neovascular AMD

- Examine patients treated with intravitreal injections of aflibercept, bevacizumab, or ranibizumab approximately 4 weeks after treatment *(III, GQ, SR)*
- Examine and perform fluorescein angiography at least every 3 months until stable after verteporfin PDT
- Examine patients treated with thermal laser photocoagulation via fluorescein angiography approximately 2 to 4 weeks after treatment and then at 4 to 6 weeks *(III, GQ, SR)*
- Subsequent examinations, OCT, and fluorescein angiography should be performed as indicated depending on the clinical findings and the judgment of the treating ophthalmologist *(III, GQ, SR)*

Patient Education

- Educate patients about the prognosis and potential value of treatment as appropriate for their visual and functional status *(III, GQ, SR)*
- Encourage patients with early AMD to assess their own visual acuity and to have regular dilated eye exams for early detection of intermediate AMD
- Educate patients with a high-risk AMD phenotype about methods of detecting new symptoms of CNV and about the need for prompt notification to an ophthalmologist *(III, GQ, SR)*
- 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 *(III, GQ, SR)*
- 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 *(III, GQ, SR)*
- Encourage patients who are currently smoking to stop because there are observational data that support a causal relationship between smoking and AMD and other considerable health benefits of smoking cessation *(I++, GQ, SR)*
- Refer patients with reduced visual function for vision rehabilitation (see www.aao.org/low-vision-and-vision-rehab) and social services *(III, GQ, SR)*

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	No clinical signs of AMD (AREDS category 1)	As recommended in the Comprehensive Adult Medical Eye Evaluation PPP
	Early AMD (AREDS category 2)	Return exam at 6 to 24 months if asymptomatic or prompt exam for new symptoms suggestive of CNV
		OCT, fluorescein angiography, or fundus photos as appropriate
	Advanced AMD with bilateral subfoveal geographic atrophy or disciform scars	Return exam at 6 to 24 months if asymptomatic or prompt exam for new symptoms suggestive of CNV
		Fundus photos or fluorescein angiography as appropriate
Antioxidant vitamin and mineral supplements as recommended in the original AREDS and AREDS2 reports	Intermediate AMD (AREDS category 3)	Monitoring of monocular near vision (reading/Amsler grid)
	Advanced AMD in one eye (AREDS category 4)	Return exam at 6 to 18 months if asymptomatic or prompt exam for new symptoms suggestive of CNV
		Fundus photography and/or fundus autofluorescence as appropriate
		Fluorescein angiography and/or OCT for suspicion of CNV
Aflibercept intravitreal injection 2.0 mg as described in published reports	Macular CNV	Patients should be instructed to report promptly 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
		Return examination approximately 4 weeks after treatment initially; subsequent follow-up and treatment depends on the clinical findings and judgment of the treating ophthalmologist. An every 8-week maintenance treatment regimen has been shown to have comparable results to every 4 weeks in the first year of therapy.
		Monitoring of monocular near vision (reading/Amsler grid)
Bevacizumab intravitreal injection 1.25 mg as described in published reports The ophthalmologist should provide appropriate informed consent with respect to the off-label status	Macular 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
		Return exam approximately 4 weeks after treatment; subsequent follow-up depends on the clinical findings and judgment of the treating ophthalmologist
		Monitoring of monocular near vision (reading/Amsler grid)
Ranibizumab intravitreal injection 0.5 mg as recommended in ranibizumab literature	Macular 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
		Return exam approximately 4 weeks after treatment; subsequent follow-up depends on the clinical findings and judgment of the treating ophthalmologist
		Monitoring of monocular near vision (reading/Amsler grid)
PDT with verteporfin as recommended in the TAP and VIP reports	Macular CNV, new or recurrent, where the classic component is >50% of the lesion and the entire lesion is ≤5400 microns in greatest linear diameter	Return exam approximately every 3 months until stable, with retreatments as indicated
	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	Monitoring of monocular near vision (reading/Amsler grid)
	Juxtafoveal CNV is an off-label indication for PDT, but may be considered in select cases.	
Thermal laser photocoagulation surgery as recommended in the MPS reports	May be considered for extrafoveal classic CNV, new or recurrent	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
	May be considered for juxtapapillary CNV	Retreatments as indicated
		Monitoring of monocular near vision (reading/Amsler grid)

AMD = age-related macular degeneration; AREDS = Age-Related Eye Disease Study; CNV = choroidal neovascularization; MPS = Macular Photocoagulation Study; OCT = optical coherence tomography; PDT = photodynamic therapy; TAP = Treatment of Age-Related Macular Degeneration with Photodynamic Therapy; VIP = Verteporfin in Photodynamic Therapy