American Academy® of Ophthalmology
The Eye M.D. Association

DIABETIC RETINOPATHY 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)

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:II] 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†
Normal or minimal NPDR	No	12	No	No	No
Mild to moderate NPDR	No	6–12	No	No	No
	Yes	2–4	No	Usually	Usually*‡
Severe NPDR	No	2–4	Sometimes§	Rarely	No
	Yes	2–4	Sometimes§	Usually	Usually ‖
Non-high-risk PDR	No	2–4	Sometimes§	Rarely	No
	Yes	2–4	Sometimes§	Usually	Usually‡
High-risk PDR	No	2–4	Usually	Rarely	No
	Yes	2–4	Usually	Usually	Usually ‖
Inactive/involuted 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 except ranibizumab). Data from the Diabetic Retinopathy Clinical Research Network in 2011 demonstrated that, at two years of follow-up, intravitreal ranibizumab with prompt or deferred laser resulted in greater visual acuity gain and intravitreal triamcinolone acetonide plus laser also resulted in greater visual gain in pseudophakic eyes compared with laser alone. Individuals receiving the intravitreal injections of anti-vascular endothelial growth factor agents may be examined one month following injection.

‡ 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. Future studies may help guide the use of intravitreal therapies including corticosteroids and anti-vascular endothelial growth factor agents in these cases in which laser photocoagulation cannot be administered safely. 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.

‖ It is preferable to perform focal photocoagulation first, prior to panretinal photocoagulation, to minimize panretinal photocoagulation laser–induced exacerbation of the macular edema.