

# Diabetic Retinopathy (Initial and Follow-up Evaluation)

## Initial Exam History (Key elements)

- Duration of diabetes
- Past glycemic control (hemoglobin A1c)
- Medications
- Medical history (e.g., obesity, renal disease, systemic hypertension, serum lipid levels, pregnancy)
- Ocular history

## Initial Physical Exam (Key elements)

- Visual acuity
- Slit-lamp biomicroscopy
- Measurement of IOP
- Gonioscopy before dilation when indicated (for neovascularization of the iris or increased IOP)
- Pupillary assessment for optic nerve dysfunction
- Thorough funduscopy including stereoscopic examination of the posterior pole
- Examination of the peripheral retina and vitreous, best performed with indirect ophthalmoscopy or with slit-lamp biomicroscopy

## Diagnosis

- Classify both eyes as to category and severity of diabetic retinopathy and macular edema. Each category has an inherent risk for progression and is dependent on adherence to overall diabetes control.

## Follow-up History

- Visual symptoms
- Systemic status (pregnancy, blood pressure, serum cholesterol, renal status)
- Glycemic status (hemoglobin A1c)

## Follow-up Physical Exam

- Visual acuity
- Measurement of IOP
- Slit-lamp biomicroscopy with iris examination
- Gonioscopy (preferably before dilation when iris neovascularization is suspected or if IOP is elevated)
- Stereoscopic examination of the posterior pole after dilation of the pupils
- Examination of the peripheral retina and vitreous when indicated
- OCT imaging when appropriate

## Ancillary Tests

- Optical coherence tomography can be used to quantify retinal thickness, monitor macular edema, identify vitreomacular traction, and detect other forms of macular disease in patients with diabetic macular edema. Decisions to repeat anti-VEGF injections, change therapeutic agents (e.g., use of intraocular corticosteroids), initiate laser treatment, or even consider vitrectomy surgery are often based in part on OCT findings.
- Fundus photography may be useful for documenting the presence of NVE and NVD, the response to treatment, and the need for additional treatment at future visits.
- Fluorescein angiography is used as a guide for laser treatment of CSME and as a means of evaluating the cause(s) of unexplained decreased visual acuity. Angiography can identify macular capillary nonperfusion 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.
- Ultrasonography enables assessment of the status of the retina in the presence of a vitreous hemorrhage or other media opacity, and may be helpful to define the extent and severity of vitreoretinal traction, especially on the macula of diabetic eyes.

## Patient Education

- Discuss results of exam and implications
- Encourage patients with diabetes but without diabetic retinopathy to have annual dilated eye exams
- Inform patients that effective treatment for diabetic retinopathy depends on timely intervention, despite good vision and no ocular symptoms
- Educate patients about the importance of maintaining near-normal glucose levels and near-normal blood pressure and lowering serum lipid levels
- Communicate with the attending physician, e.g., family physician, internist, or endocrinologist, regarding eye findings
- 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
- Refer patients with functionally limiting postoperative visual impairment for vision rehabilitation (see [www.aaao.org/smartsight](http://www.aaao.org/smartsight)) and social services

# Diabetic Retinopathy (Management Recommendations)

## Management Recommendations for Patients with Diabetes

Severity of Retinopathy	Presence of Macular Edema	Follow-up (Months)	Panretinal Photocoagulation (Scatter) Laser	Focal and/or Grid Laser*	Intravitreal Anti-VEGF Therapy
Normal or minimal NPDR	No	12	No	No	No
Mild NPDR	No	12	No	No	No
	ME	4–6	No	No	No
	CSME†	1*	No	Sometimes	Sometimes
Moderate NPDR	No	6–12	No	No	No
	ME	3–6	No	No	No
	CSME†	1*	No	Sometimes	Sometimes
Severe NPDR	No	4	Sometimes	No	No
	ME	2–4	Sometimes	No	No
	CSME†	1*	Sometimes	Sometimes	Sometimes
Non-high-risk PDR	No	4	Sometimes	No	No
	ME	4	Sometimes	No	No
	CSME†	1*	Sometimes	Sometimes	Sometimes
High-risk PDR	No	4	Recommended	No	Considered
	ME	4	Recommended	Sometimes	Usually
	CSME†	1*	Recommended	Sometimes	Usually

Anti-VEGF = anti-vascular endothelial growth factor; CSME = clinically significant macular edema; ME = non-clinically significant macular edema; NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy

\* Adjunctive treatments that may be considered include intravitreal corticosteroids or anti-VEGF agents (off-label use, except aflibercept and 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 acetate plus laser also resulted in greater visual gain in pseudophakic eyes compared with laser alone. Individuals receiving the intravitreal injections of anti-VEGF agents may be re-examined as early as one month following injection.

† 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.