AAVBC
AMERICAN ACADEMY OF VALUE BASED CARE

Diabetic Eye Disease

Quick Reference Guide

2026

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1 CLINICAL SNAPSHOT

Definition: Diabetic retinopathy (DR) is a progressive **neurovascular complication of chronic hyperglycemia** in type 1 or type 2 diabetes. Persistent hyperglycemia promotes glycation, oxidative stress, inflammation, endothelial injury, and breakdown of the blood-retinal barrier. These changes cause **capillary leakage, microaneurysms, retinal hemorrhage, ischemia, and abnormal neovascularization**. DR progresses from mild, moderate, or severe nonproliferative diabetic retinopathy (NPDR) to proliferative diabetic retinopathy (PDR). **Diabetic macular edema (DME)** may occur at any stage when damaged retinal vessels leak fluid into the macula.[1,2] Severe NPDR, PDR, and center-involved DME are vision-threatening and may lead to vitreous hemorrhage, tractional retinal detachment, and irreversible vision loss.[2,3,]

ICD-10 Codes:

Diabetic retinopathy codes require four documented elements: **diabetes type, retinopathy severity, macular-edema status, and laterality**. Use the complete code identified from the ophthalmology diagnosis. Examples include **E11.3411/E11.3412/E11.3413** for severe NPDR with macular edema in the right, left, or bilateral eyes and **E11.3491/E11.3492/E11.3493** for severe NPDR without macular edema. Avoid abbreviated code stems in the final assessment when the complete laterality-specific code is known.[2,4-6]

Prevalence: Diabetic retinopathy affects approximately **one-quarter of U.S. adults with diabetes**, and about **5.1% have vision-threatening disease**, including severe NPDR, PDR, or diabetic macular edema. Recent U.S. estimates indicate that approximately **9.6 million people** are living with diabetic retinopathy, including **1.84 million with vision-threatening diabetic retinopathy**.[1,7] Risk rises with **longer diabetes duration, poor glycemic control, hypertension, chronic kidney disease, albuminuria, pregnancy, and missed retinal screening**. Retinopathy generally develops **≥5 years after the onset of type 1 diabetes** but may already be present at the time of **type 2 diabetes diagnosis**. After approximately **20 years of type 1 diabetes, nearly all patients show some degree of retinopathy**, and a substantial proportion develop proliferative disease. Diabetic retinopathy may remain clinically silent until advanced; many patients with mild or even vision-threatening disease are unaware that retinal damage is present. Screening gaps remain common, especially in underserved and older populations, increasing the risk of preventable vision loss, falls, medication errors, loss of independence, depression, transportation barriers, and caregiver dependence.[8-10]

HCC/RAF V28 Mapping

ICD-10 CODE(S)[4,5]	HCC CATEGORY (V28)	RAF (CNA)	DOCUMENTATION REQUIREMENT
E11.34x- Type 2 diabetes with severe NPDR	**HCC 37 —** (Diabetes with Chronic Complications) **+ HCC 298** — Severe Diabetic Eye Disease, Retinal Detachment, and Other Retinal Disorders	**0.502** (0.166+ 0.336)	Document **type 2 diabetes with severe NPDR**, macular-edema status, and laterality. Include current visual symptoms, ophthalmology findings, and treatment or surveillance plan[2,4,5]
E11.351x — Type 2 diabetes with PDR	**HCC 37 + HCC 298**	**0.502** (0.166+ 0.336)	Document **PDR**, macular-edema status, laterality, neovascularization status, and active treatment such as anti-VEGF, laser, or vitrectomy[2,4,5]
E11.352x/ E11.353x— Type 2 diabetes mellitus with PDR with traction retinal detachment involving the macula	**HCC 37 + HCC 298**	**0.502** (0.166+ 0.336)	Document **traction retinal detachment**, macular involvement, laterality, visual impairment, and retina-specialist management[2,5]
E11.355x — Type 2 diabetes mellitus with stable proliferative diabetic retinopathy	**HCC 37 + HCC 298**	**0.502** (0.166+ 0.336)	Use only when ophthalmology documents **stable PDR** after treatment. Do not infer stability from remote laser or injection history alone[2,5]
E10.34x–E10.35x; E08.34x–E09.35x; E13.34x–E13.35x — Severe NPDR or PDR associated with other diabetes types	**HCC 37 + HCC 298**	**0.502** (0.166+ 0.336)	Apply the same specificity for **diabetes type, retinopathy stage, macular edema, laterality, and treatment status**[2,5]

ICD-10 CODE(S)[4,5]	HCC CATEGORY (V28)	RAF (CNA)	DOCUMENTATION REQUIREMENT
E11.36 — Type 2 diabetes with diabetic cataract	**HCC 37-** Diabetes with Chronic Complications	0.166	Document **diabetic cataract** separately when present; do not use it as a substitute for active retinopathy coding[2,5]
E11.31x–E11.33x — Type 2 diabetes with mild, moderate, or unspecified NPDR	**HCC 37**	0.166	Mild, moderate, or unspecified NPDR **without macular edema** does not map to HCC 298. Document the exact stage and laterality[4,5]
E11.9 — Type 2 diabetes without complications	**HCC 38 -** Diabetes With Glyciemic, unspecified or no complications	0.166	**Do not use it when diabetic retinopathy is documented.** Standalone uncomplicated Type 2 DM. Hierarchy Rule: If any code from HCC 37 is documented in the same year, HCC 37 trumps HCC 38. Code the confirmed eye complication with the appropriate laterality and severity[2,5,6]

ABBREVIATIONS: DM = diabetes mellitus; DME = diabetic macular edema; DR = diabetic retinopathy; HCC = hierarchical condition category; ICD-10 = International Classification of Diseases, 10th Revision; IH = intraretinal hemorrhage; IRMA = intraretinal microvascular abnormalities; NPDR = nonproliferative diabetic retinopathy; NVD = neovascularization of the disc; NVE = neovascularization elsewhere; NVE = neovascularization elsewhere; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation; RAF = risk adjustment factor; T1DM/T2DM = type 1/type 2 diabetes mellitus; TRD = tractional retinal detachment. RAF coefficients, HCC mapping, and base rate per CMS CY2026 sources[11,12,13,14]

RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model; values vary across patient populations based on eligibility and care setting

Risk-Adjusted Care Resources per Patient/Year[11,12]

RAF weight × $10,402.34 MA base rate = estimated annual care coordination support per documented HCC8,9

SEVERE DIABETIC EYE DISEASE
~$5,222

HCC 298 + HCC37 · RAF 0.336 + 0.166 = 0.502

2 RECOGNITION AND DIAGNOSIS

Medicare Diagnostics and Surveillance (Adult and Geriatric)

TEST (CPT)	COVERAGE	POPULATION/TIMING	CLINICAL INDICATION
Dilated retinal examination[13] **(92250 — fundus photography; 2026F — quality reporting code for dilated eye examination performed)**	Covered annually under Medicare Part B for beneficiaries with diabetes	**Type 2 diabetes:** at diagnosis. **Type 1 diabetes:** 5 years after onset. Generally annually thereafter; every **1–2 years** may be considered only after one or more normal examinations with stable glycemic control	Detects **diabetic retinopathy, diabetic macular edema, vitreous hemorrhage, and other vision-threatening retinal disease** that may remain asymptomatic. **Refer promptly when retinopathy is identified**[12]
Validated retinal photography or AI-assisted screening (92229 — retinal imaging with automated point-of-care analysis and report)	Covered when performed through an eligible FDA-authorized autonomous AI system or other covered retinal-imaging service; verify local payer requirements	Use when timely dilated examination is unavailable and there are **no acute visual symptoms or known advanced retinopathy**	Expands screening access. **Positive or ungradable results require eye-care referral** and do not replace a comprehensive ophthalmic examination[12]
Teleretinal screening (92227 — remote retinal imaging with automated analysis; 92228 — remote retinal imaging with physician or qualified health care professional interpretation and report)	Coverage varies by Medicare Administrative Contractor and payer; verify locally	Use for patients with transportation or eye-care access barriers, according to the local screening protocol	Supports remote diabetic-retinopathy screening and expands access. **Abnormal or ungradable images require comprehensive eye-care evaluation**

TEST (CPT)	COVERAGE	POPULATION/TIMING	CLINICAL INDICATION
Optical coherence tomography (OCT) of the retina (92134 — posterior-segment OCT, unilateral or bilateral, with interpretation and report)	Covered when medically necessary for diagnosing or monitoring retinal disease; payer requirements vary	At diagnosis or follow-up of suspected diabetic macular edema, unexplained visual decline, or treatment response	Confirms and quantifies **intraretinal or subretinal fluid and center involvement**; guides retina-specialist treat[2]
HbA1c, BP, lipid panel (83036 — HbA1c; 80061 — lipid panel; blood-pressure measurement is generally included in the applicable E/M service)	Covered as part of diabetes management when medically necessary and within applicable payer requirements	At routine diabetes follow-up and more often when above target or therapy changes	At routine diabetes follow-up and more often when above target or when therapy changes[15,16]
Albumin-to-creatinine ratio (ACR) and eGFR (82043 — urine microalbumin; 82570 — urine creatinine; serum creatinine/eGFR reported through the applicable metabolic or renal-function panel	Covered annually for diabetes	At least annually in diabetes; more often with established CKD or an abnormal result	Kidney and retinal microvascular disease often coexist. **Albuminuria or declining eGFR should lower the threshold for prompt retinal evaluation and follow-up** [17]

ABBREVIATIONS: ACR = albumin-to-creatinine ratio; AI = artificial intelligence; AWV = Annual Wellness Visit; BP = blood pressure; CI-DME = center-involved diabetic macular edema; CPT = Current Procedural Terminology; DME = diabetic macular edema; DR = diabetic retinopathy; eGFR = estimated glomerular filtration rate; HbA1c = hemoglobin A1c; HCC = hierarchical condition category; MAC = Medicare Administrative Contractor; NCI-DME = non-center-involved diabetic macular edema; NPDR = nonproliferative diabetic retinopathy; OCT = optical coherence tomography; PCP = primary care provider; PDR = proliferative diabetic retinopathy; SBP = systolic blood pressure

Type 1 vs Type 2 Diabetes: Retinopathy Screening

FEATURE	TYPE 1 DIABETES	TYPE 2 DIABETES
Retinopathy onset	Usually develops **5–15 years** after diagnosis	May be present **at diagnosis**

FEATURE	TYPE 1 DIABETES	TYPE 2 DIABETES
Initial eye examination	Within **5 years** of diagnosis	**At diagnosis**
Clinical implication	Longer disease duration increases lifetime risk	Screen immediately, retinopathy may already be present

Subtle Early Signs in Older Adults (>65)

SUBTLE SIGN IN OLDER ADULTS	WHY IT IS MISSED	CLINICAL SIGNIFICANCE
New blurred or fluctuating vision	Attributed to aging, cataract, dry eye, or refractive change	May reflect **diabetic macular edema or glycemic-related refractive change**. Arrange retinal evaluation if persistent or after treatment intensification[19,20]
Sudden dark floaters, streaks, or a "spider web" across vision	Dismissed as benign age-related vitreous change	Suggests **vitreous hemorrhage from PDR**. Arrange **urgent dilated examination**[2,21]
Sudden, drastic loss of vision in one eye	Misattributed to chronic diabetic eye disease or cataract	Consider **retinal artery occlusion, retinal detachment, or vitreous hemorrhage**. Treat as an emergency[21]
Painful red eye with halos, headache, nausea, or vomiting	Mistaken for migraine, sinus disease, or conjunctivitis	May indicate **acute angle-closure glaucoma or severe intraocular-pressure elevation**. Arrange emergency ophthalmologic assessment[22]
Flashing lights with curtain-like visual field defect	Mistaken for migraine aura or uncomplicated vitreous detachment.	Suggests **retinal tear or detachment**. Arrange **same-day retinal evaluation**[21]
“Good vision” with no screening in >1 year	Preserved central vision falsely reassures patient and PCP	DR may remain **asymptomatic until advanced**. Arrange overdue screening

ABBREVIATIONS: CKD = chronic kidney disease; CRAO = central retinal artery occlusion; DM = diabetes mellitus; DR = diabetic retinopathy; EWDR = early worsening of diabetic retinopathy; GLP-1 RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; IOP = intraocular pressure; NPDR = nonproliferative diabetic retinopathy; NVG = neovascular glaucoma; PDR = proliferative diabetic retinopathy

CLINICAL PEARL - GOOD VISION DOES NOT MEAN HEALTHY EYES

Diabetic retinopathy may remain **silent until vision is threatened**. Do not rely on symptoms to trigger screening or referral; confirm retinal evaluation based on diabetes status and prior findings.

Geriatric Risk Factors

FACTOR	RISK SIGNAL	NOTES
Type 1 diabetes and long disease duration	**Earlier onset and longer cumulative exposure to hyperglycemia** increase lifetime risk of diabetic retinopathy. Long-term WESDR data found that **nearly 99% of people with type 1 diabetes** developed retinopathy after 20 years, compared with **approximately 60% of people with type 2 diabetes**[38]	Confirm **diabetes type, duration, glycemic control, and retinal-screening status**. Do not rely on diabetes type alone; prioritize timely ophthalmology follow-up, especially with longstanding disease or missed eye examinations
Frailty with high loss-to-follow-up risk on anti-VEGF	Missed visits and treatment interruption increase visual decline[26]	Screen frailty, transportation, and caregiver support; confirm appointment completion[25,27]
CKD	**Reduced eGFR and albuminuria** are associated with **more severe and progressive diabetic retinopathy** and may affect treatment planning[17,28]	Track **eGFR and urine ACR**, confirm retinal surveillance is current, and coordinate renal, glycemic, and blood-pressure management[24]
Hypertension	Poor BP control **accelerates retinal ischemia, edema, hemorrhage, and disease progression**[15]	Review BP control and adherence; avoid symptomatic hypotension[5]
Concurrent ocular disease — AMD, glaucoma, cataract	Coexisting disease can obscure findings and complicate attribution of vision loss[32]	Do not attribute all vision loss to diabetes. Confirm a **comprehensive ophthalmic examination** and document each active ocular diagnosis separately[33]
Low vision, depression, or social isolation	Visual impairment may worsen mood, adherence, independence, and quality of life[29,5]	Screen mood and function; refer for **low-vision services, social support, and caregiver assistance** when needed[25,5]

FACTOR	RISK SIGNAL	NOTES

ABBREVIATIONS: ACR = albumin-to-creatinine ratio; AMD = age-related macular degeneration; anti-VEGF = anti-vascular endothelial growth factor; AWV = Annual Wellness Visit; BP = blood pressure; CKD = chronic kidney disease; DME = diabetic macular edema; DR = diabetic retinopathy; eGFR = estimated glomerular filtration rate; FFS = fee-for-service; HR = hazard ratio; IOP = intraocular pressure; IRR = incidence rate ratio; LTFU = lost to follow-up; MA = Medicare Advantage; nAMD = neovascular age-related macular degeneration; NPDR = nonproliferative diabetic retinopathy; OR = odds ratio; PDR = proliferative diabetic retinopathy; PHQ-9 = Patient Health Questionnaire 9-item; PRP = panretinal photocoagulation; QoL = quality of life; RR = relative risk; SBP = systolic blood pressure; SDoH = social determinants of health; SGLT2 = sodium-glucose cotransporter-2; T2DM = type 2 diabetes mellitus

Diagnostic Thresholds

TEST/MARKER	DIAGNOSIS CRITERION	NOTES
Dilated fundus examination	**No DR:** mild NPDR; **Moderate NPDR:** more than microaneurysms only; **Severe NPDR:** 4-2-1 rule; **PDR:** neovascularization or preretinal/vitreous hemorrhage	A PCP may identify abnormalities during an undilated ophthalmoscopic examination, but **comprehensive dilated fundus examination** remains the diagnostic standard. **Refer severe NPDR and PDR promptly to ophthalmology**[1,2,3,36]
DME classification	**No DME, non-center-involved DME, or center-involved DME**	OCT is commonly used to determine center involvement. **Center-involved DME with visual impairment is the strongest indication for retina-specialist treatment consideration**[2,3]
Optical coherence tomography (OCT)	Confirms **retinal thickening, intraretinal or subretinal fluid, and center involvement**	Standard for diagnosing and monitoring DME. **Findings should be interpreted with visual acuity and symptoms; structural and functional severity may not fully align**
FDA-authorized AI retinal screening	Binary result: **more-than-mild DR present or absent**	Useful for point-of-care screening when eye-care access is limited. **Positive or ungradable results require referral** and do not replace a comprehensive dilated examination when symptoms or known disease are present[3,12]
HbA1c severity and progression marker	Higher HbA1c and a **large or rapid reduction** increase short-term progression risk in susceptible patients[37,38]	Review the HbA1c trajectory, not only the current value. In patients with advanced baseline DR, confirm retinal follow-up before or during major glycemic intensification[31]

TEST/MARKER	DIAGNOSIS CRITERION	NOTES
Urine albumin-to-creatinine ratio and eGFR	**ACR ≥300 mg/g** or **eGFR <30 mL/min/1.73 m^2** signals high systemic microvascular burden	CKD and DR often progress together. **Albuminuria or falling eGFR should lower the threshold for confirming retinal evaluation and follow-up**[17]

ABBREVIATIONS: AAO = American Academy of Ophthalmology; ACR = albumin-to-creatinine ratio; ADA = American Diabetes Association; AI = artificial intelligence; CI-DME = center-involved diabetic macular edema; CPT = Current Procedural Terminology; DME = diabetic macular edema; DR = diabetic retinopathy; eGFR = estimated glomerular filtration rate; ETDRS = Early Treatment Diabetic Retinopathy Study; FDA = Food and Drug Administration; HbA1c = hemoglobin A1c; HCC = hierarchical condition category; HR = hazard ratio; ICDRDS = International Clinical Diabetic Retinopathy Disease Severity; NCI-DME = non-center-involved diabetic macular edema; NPDR = nonproliferative diabetic retinopathy; NVD = neovascularization of the disc; NVE = neovascularization elsewhere; OCT = optical coherence tomography; OR = odds ratio; PCP = primary care provider; PDR = proliferative diabetic retinopathy; RR = relative risk

CLINICAL PEARL - DIRECT OPHTHALMOSCOPY: PRACTICAL PCP FINDINGS

A **direct ophthalmoscope** may identify clinically significant diabetic retinopathy during an undilated examination, including **microaneurysms, retinal hemorrhages, hard exudates, cotton-wool spots, venous beading,** and **neovascularization**. **Any suspicious findings warrant referral for a comprehensive dilated fundus examination, which remains the diagnostic standard.**

Common Oversights

CLINICAL OVERSIGHT	WHY IT MATTERS - WHAT TO DO INSTEAD
Treating "refer to ophthalmology" as a closed loop	Referral does not confirm screening or treatment. **Track completion, obtain the report, and document DR stage, DME status, laterality, treatment, and follow-up interval**
Rapid glycemic intensification without retinal review	A large HbA1c reduction may temporarily worsen established retinopathy. **Confirm retinal follow-up before further rapid intensification**
CKD or albuminuria risk overlooked	Renal and retinal microvascular disease often progress together. **Verify retinal surveillance when ACR rises or eGFR declines**
Severe NPDR treated as routine follow-up	Severe NPDR has a high risk of progression to PDR. **Arrange prompt retina follow-up and document the exact interval**
Screening deferred because vision is preserved	Diabetic retinopathy may remain asymptomatic until advanced. **Do not use preserved vision as a reason to delay screening**
Dual sensory impairment overlooked	Combined vision and hearing loss increases **falls, medication errors, isolation, and loss of independence**. Assess function, home safety, caregiver support, and sensory-service needs

CLINICAL OVERSIGHT	WHY IT MATTERS - WHAT TO DO INSTEAD
Baseline retinal exam missed in type 2 diabetes	Retinopathy may already be present at diagnosis. **Arrange a dilated retinal examination at diagnosis and document the result and follow-up plan**

ABBREVIATIONS: ADA = American Diabetes Association; DR = diabetic retinopathy; DME = diabetic macular edema; EHR = electronic health record; eGFR = estimated glomerular filtration rate; EWDR = early worsening of diabetic retinopathy; GLP-1 RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; LENS = Lowering Events in Non-proliferative retinopathy in Scotland (trial); NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy

Key Differentials in Elderly

PRESENTATION	DIFFERENTIAL	KEY TESTS
Sudden painless vision loss in one eye	Central retinal artery occlusion, central retinal vein occlusion, vitreous hemorrhage, retinal detachment, ischemic optic neuropathy	**Emergency dilated retinal examination**, visual acuity, pupillary response, intraocular pressure, OCT/fundus imaging; activate stroke evaluation when retinal ischemia is suspected[21]
Painful red eye with headache, halos, nausea, or vomiting	Acute angle-closure glaucoma, uveitis, keratitis, severe intraocular-pressure elevation	**Immediate tonometry and slit-lamp examination**; emergency ophthalmology referral[22]
New floaters, flashes, or curtain-like field loss	Posterior vitreous detachment, retinal tear, retinal detachment, vitreous hemorrhage	**Urgent dilated examination** with peripheral retinal assessment; ocular ultrasound if the fundus cannot be visualized[2,21]
Blurred or fluctuating vision after rapid glucose improvement	Glycemic refractive shift, diabetic macular edema, early worsening of retinopathy	Check HbA1c trajectory, visual acuity, **dilated retinal examination and OCT**; coordinate ophthalmology before further rapid intensification[19,20]
Gradually progressive visual decline	Cataract, diabetic macular edema, age-related macular degeneration, glaucoma, refractive change	Visual acuity, **dilated retinal examination, OCT**, intraocular pressure, and formal visual-field testing when indicated[8]
Bilateral visual field loss with overlapping eye disease	Glaucoma, stroke, diabetic retinopathy, macular disease, neuro-ophthalmic disease	Formal visual fields, OCT nerve-fiber and macular analysis, dilated examination, and neuroimaging when the pattern suggests a central lesion[42,43]

PRESENTATION	DIFFERENTIAL	KEY TESTS

ABBREVIATIONS: AMD = age-related macular degeneration; CRAO = central retinal artery occlusion; DR = diabetic retinopathy; ED = emergency department; EWDR = early worsening of diabetic retinopathy; GLP-1 RA = glucagon-like peptide-1 receptor agonist; IOP = intraocular pressure; NPDR = nonproliferative diabetic retinopathy; NVG = neovascular glaucoma; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation; VF = visual field

CLINICAL PEARL – TIGHT GLYCEMIC CONTROL PRESERVES VISION

Tight glycemic control remains the most effective strategy to prevent or delay diabetic retinopathy. Landmark evidence indicates that each **1% reduction in HbA1c** is associated with approximately a **35% lower risk of microvascular complications**, including diabetic retinopathy.[38] Encourage individualized HbA1c targets while avoiding overly rapid glucose reduction in patients with advanced retinopathy.[19,20]

Comorbidity Screening

CONDITION	WHY SCREEN IN DIABETIC EYE DISEASE	ACTION
CKD/albuminuria	Signals higher microvascular burden and DR progression risk[17]	**Track eGFR and ACR; confirm retinal surveillance**[17,24]
Hypertension	Accelerates retinal ischemia, edema, and hemorrhage[15]	**Review BP control and adherence**[5,31]
Cataract	May obscure retinal findings and worsen functional vision[5,2]	**Document separately and coordinate ophthalmology**[2,5]
Age-related macular degeneration (AMD)	May complicate the cause of central vision loss[10,32]	**Differentiate with OCT and comprehensive exam**[32,44]
Glaucoma/ocular hypertension	May coexist and contribute to visual-field loss[10,22]	**Confirm IOP and visual-field follow-up**[33,42]
Depression	Worsens adherence, independence, and quality of life[29,5]	**Screen mood and refer for low-vision support**[5]
Frailty and cognitive impairment	Increases missed visits, falls, and medication errors[25]	**Missed appointments and treatment delays are common when cognition or mobility is limited; involve caregivers early**[25,27]

CONDITION	WHY SCREEN IN DIABETIC EYE DISEASE	ACTION

ABBREVIATIONS: ACEi = angiotensin-converting enzyme inhibitor; ACR = albumin-to-creatinine ratio; AMD = age-related macular degeneration; anti-VEGF = anti-vascular endothelial growth factor; ARB = angiotensin receptor blocker; BP = blood pressure; CKD = chronic kidney disease; CV = cardiovascular; DME = diabetic macular edema; DR = diabetic retinopathy; eFI = electronic frailty index; eGFR = estimated glomerular filtration rate; FFS = fee-for-service; HR = hazard ratio; LTFU = lost to follow-up; nAMD = neovascular age-related macular degeneration; NVG = neovascular glaucoma; OR = odds ratio; PDR = proliferative diabetic retinopathy; PHQ-9 = Patient Health Questionnaire 9-item; PRP = panretinal photocoagulation; QoL = quality of life; RR = relative risk; SBP = systolic blood pressure; SGLT2 = sodium-glucose cotransporter-2; T2DM = type 2 diabetes mellitus; VF = visual field

Disease Staging and Severity Matrix

Diabetic retinopathy severity should be assessed using **retinal findings, macular edema, visual function, and need for escalation**. PCPs should recognize **severe NPDR, PDR, center-involved DME, and retinal detachment** as vision-threatening disease and should not delay referral while awaiting progression of symptoms.

DISEASE ACTIVITY CATEGORY	PRACTICAL MARKERS	ACTION REQUIRED
No apparent retinopathy	No diabetic retinal abnormalities on dilated examination	Continue **annual retinal screening**; consider every **1–2 years** only after normal examinations, stable glycemic control, and reliable follow-up. Optimize **HbA1c, BP, and lipids**[2,5]
Mild NPDR	**Microaneurysms only**	Continue **annual ophthalmology follow-up** and systemic risk-factor management. Document laterality and confirm the next screening interval[2,40]
Moderate NPDR	More than microaneurysms but less than severe NPDR	Arrange ophthalmology follow-up every **6–9 months**. Reinforce glycemic, BP, lipid, and renal control, and use **closed-loop referral tracking**[2,5]
Severe NPDR 4-2-1 rule	**>20 intraretinal hemorrhages in each of 4 quadrants**, venous beading in **≥2 quadrants**, or IRMA in **≥1 quadrant**, without PDR	Arrange **urgent ophthalmology or retina referral within 2–4 weeks**. Document the exact findings, laterality, referral completion, and follow-up interval[2,5,39]
Proliferative diabetic retinopathy	**Neovascularization of the disc or elsewhere**, preretinal or vitreous hemorrhage, or tractional retinal detachment	Arrange **immediate retina-specialist referral**. Document neovascularization, hemorrhage, detachment, macular involvement, laterality, and active treatment status[2,5,39]

DISEASE ACTIVITY CATEGORY	PRACTICAL MARKERS	ACTION REQUIRED
Center-involved DME	OCT-confirmed center involvement, with or without visual impairment	Arrange **prompt retina evaluation** for anti-VEGF or other specialist-directed treatment. Track visual acuity, OCT findings, treatment response, and follow-up interval[2,3]

ABBREVIATIONS: BP = blood pressure; CI-DME = center-involved diabetic macular edema; DME = diabetic macular edema; EHR = electronic health record; HbA1c = hemoglobin A1c; HCC = hierarchical condition category; IH = intraretinal hemorrhage; IRMA = intraretinal microvascular abnormalities; LENS = LENS trial (Logue/Preiss 2026); NPDR = nonproliferative diabetic retinopathy; NVD = neovascularization of the disc; NVE = neovascularization elsewhere; PDR = proliferative diabetic retinopathy

⚠ RED FLAG — URGENT (24-72 HOURS)

- **Severe NPDR newly identified** — Arrange a **closed-loop retina referral within 2–4 weeks** and document the exact follow-up interval
- **New or worsening DME** — Expedite retina evaluation, especially with **center involvement or visual impairment**, for possible anti-VEGF treatment
- **Rapid visual decline with known severe NPDR or PDR** — Arrange **urgent retina assessment** to evaluate for progression, vitreous hemorrhage, or tractional change
- **New floaters or reduced vision with known PDR** — Obtain **urgent dilated retinal evaluation within 24–48 hours** for possible vitreous hemorrhage
- **Early worsening after rapid glycemic intensification** — Coordinate with ophthalmology before further rapid dose escalation when vision declines after a large HbA1c reduction
- **Missed retina follow-up in severe NPDR, PDR, or active DME** — Re-establish care promptly; frailty, transportation barriers, and cognitive impairment increase treatment-abandonment risk

⚠ RED FLAG — EMERGENCY CRISIS RESPONSE

- **Sudden painless monocular vision loss** — Treat as possible **retinal artery occlusion, massive vitreous hemorrhage, or retinal detachment**; send for emergency ophthalmology and vascular evaluation
- **Painful red eye with elevated intraocular pressure and a fixed mid-dilated pupil** — Suspect **acute angle-closure or neovascular glaucoma**; arrange immediate pressure-lowering treatment and emergency ophthalmology care
- **Flashing lights with curtain-like visual-field loss** — Suspect **retinal tear or detachment**; arrange **same-day retinal-surgery evaluation**
- **Dense vitreous hemorrhage or macula-threatening tractional retinal detachment** — Arrange **immediate retina-specialist assessment**
- **Iris neovascularization with pain or elevated pressure** — Treat as **neovascular glaucoma** and coordinate urgent retina and glaucoma management

AAVBC PERSPECTIVE

In value-based primary care, the key action is a **direct, tracked, closed-loop retina referral**. Severe NPDR, PDR, and active DME are not “wait-and-watch” conditions. Confirm appointment completion, obtain the eye-care report, and document **disease stage, laterality, DME status, treatment plan, and next follow-up interval**. Pair referral tracking with **gradual glycemic intensification when advanced DR is present** and **frailty-aware treatment planning** for patients at high risk of missed visits.[2,5,19,25,40]

3 MEAT DOCUMENTATION AND ESSENTIALS

Diabetic eye disease documentation should translate the patient’s visual, metabolic, and functional complexity into a record that supports **continuity, treatment safety, quality measurement, and care planning**. Common gaps include vague “diabetic retinopathy” language; missing **severity, DME status, laterality, visual acuity, treatment status, or referral completion**; and failure to document systemic risk factors that affect progression.

*Case vignette: A 71-year-old retired postal worker with a 17-year history of type 2 diabetes presents for annual review. His most recent ophthalmology note documents **severe nonproliferative diabetic retinopathy with center-involved diabetic macular edema in the right eye** and **moderate nonproliferative diabetic retinopathy without macular edema in the left eye**. He reports new blurred vision and “spots” in the right visual field over 10 days, beginning 3 weeks after semaglutide initiation. Visual acuity is **20/50 OD and 20/30 OS**. OCT shows right central macular thickening and intraretinal fluid. HbA1c decreased from 10.6% to 9.4% over 3 months; eGFR is 48 mL/min/1.73 m^2, and urine albumin-to-creatinine ratio is 312 mg/g. His wife assists with medication supervision and transportation.*

MONITOR: "**Right eye:** severe NPDR with **center-involved diabetic macular edema**, visual acuity **20/50**, and OCT-confirmed intraretinal fluid. **Left eye:** moderate NPDR **without macular edema**, visual acuity **20/30**, with no neovascularization. **Systemic trajectory:** HbA1c decreased from 10.6% to 9.4%; BP remains above target; CKD with albuminuria persists. **New right-eye blurred vision persists; urgent retina follow-up is pending**."

EVALUATE: "Visual acuity decline and OCT-confirmed intraretinal fluid support **center-involved DME with visual impairment in the right eye.** No vitreous hemorrhage, retinal detachment, or neovascular glaucoma is documented. The timing of symptoms after rapid glycemic improvement raises concern for **early worsening of diabetic retinopathy**, while CKD, albuminuria, hypertension, and longstanding diabetes increase progression risk. Medication adherence, renal function, fall risk, and transportation barriers were reviewed."

ASSESS: "**Type 2 diabetes mellitus with severe nonproliferative diabetic retinopathy and macular edema, right eye — E11.3411; type 2 diabetes mellitus with moderate nonproliferative diabetic retinopathy without macular edema, left eye — E11.3392.** Active comorbidities include **CKD stage 3a with albuminuria, hypertension, hyperlipidemia, and elevated fall risk**. The right eye has **active vision-threatening disease** requiring urgent retina evaluation; the left eye remains under surveillance."

TREAT: "**Urgent retina-specialist referral** arranged within 5–7 business days for evaluation of center-involved macular edema and possible intravitreal anti-VEGF therapy. The patient and spouse were counseled on **urgent warning signs** including sudden vision loss, increasing floaters, flashes, curtain-like field loss, or eye pain. Diabetes treatment will continue with **gradual glycemic improvement**, avoiding overly rapid intensification when possible, while PCP co-manages **BP control, renal protection, lipid therapy, fall prevention, medication reconciliation, and transportation support**. Follow-up with primary care is scheduled in 2 weeks to confirm referral completion and review the ophthalmology plan."

Clinical Documentation Elements

- **Document all four ICD-10 axes at every visit: Diabetes type + retinopathy severity + macular edema status + laterality.** The note must explicitly state, e.g., "T2DM with severe NPDR with macular edema, right eye." Any missing axis defaults to a non-specific code[2,5]
- **Use the "with" convention for causal language:** ICD-10 presumes a causal link between diabetes and ophthalmic complications coded in the E08–E13 family — but the note should still document the link explicitly ("diabetic retinopathy due to T2DM" or "T2DM with severe NPDR"). Do not assume coders will infer[2,5]
- **Document the closed-loop referral and verify completion:** For severe NPDR and any PDR, the note must reflect **referral sent, urgency communicated, appointment date confirmed, and follow-up to verify completion**. A referral without tracking is not sufficient — 25% of patients with vision-threatening DR do not report to planned follow-up[2,39]
- **Capture the EWDR risk window for glycemic intensification:** When initiating or intensifying GLP-1 RA or insulin in a patient with HbA1c > 10% or known moderate-to-severe NPDR/PDR, document: "**Retinal evaluation obtained [date]/scheduled [date] prior to initiating [agent]**" per ADA 2026[5,19,20]

- **Document the systemic comorbidity bundle: HbA1c (with target), BP (with target), LDL (with target), ACR, eGFR**, and the active therapeutic plan at every visit. Rising ACR or falling eGFR should appear in the assessment as a DR risk-amplifier signal that expedites retinal evaluation[5,17,24]
- **Document the frailty-LTFU consideration when applicable:** For patients at high LTFU risk (frailty, transportation barriers, cognitive impairment), document the **discussion of PRP vs anti-VEGF trade-offs** and the shared decision reached. This is the central VBC documentation gap for diabetic eye disease[25,27]

Reframing Common Documentation Shortcuts

INSTEAD OF…	DOCUMENT…
"Diabetic retinopathy"	"**T2DM with severe NPDR with center-involved macular edema, right eye (E11.341)**, and moderate NPDR without DME, left eye (E11.339)" — name diabetes type, severity, DME status, and laterality at every visit[2,5]
"Diabetic eye disease, history of"	"**T2DM with PDR with macular edema, bilateral (E11.353)**, status post PRP 2024, currently stable on anti-VEGF q12 weeks" — name current status (active vs stable), prior treatment, and current management[2,5]
E11.9 — Type 2 diabetes mellitus without complications	When ophthalmology has documented DR, this is **inaccurate** — use the specific E11.3xx code. E11.9 forfeits HCC 298 and misrepresents disease complexity[2,5,6]
"Refer to ophthalmology"	"**Urgent closed-loop referral to retina specialist** for severe NPDR right eye — appointment scheduled [date], EHR alert set for completion verification at next visit"[2,39]
"A1c improving on semaglutide"	"A1c 10.6 → 9.4% over 4 weeks on semaglutide 0.5 mg weekly; **retinal evaluation scheduled [date] prior to further dose escalation per ADA 2026 EWDR caution**, given baseline severe NPDR"[5,19,20]
"On statin and lisinopril"	"Atorvastatin continued for cardiovascular-risk reduction; BP remains above individualized target on lisinopril. **Antihypertensive therapy adjusted**, and fenofibrate considered for existing diabetic retinopathy with **product-specific renal-dose review and safety monitoring**"[40,41,5]
"Patient declines eye exam"	"Patient declines ophthalmology referral at this visit; **documented education on silent-disease risk (89% with mild DR/55% with VTDR unaware), revisit at next visit, spouse engaged for follow-up planning, transportation barrier identified — MA transportation benefit offered**[8,9,35]

INSTEAD OF…	DOCUMENT…

ABBREVIATIONS: ADA = American Diabetes Association; BP = blood pressure; DR = diabetic retinopathy; DME = diabetic macular edema; EHR = electronic health record; EWDR = early worsening of diabetic retinopathy; eGFR = estimated glomerular filtration rate; HCC = hierarchical condition category; LDL = low-density lipoprotein; LENS = LENS trial (Logue/Preiss 2026); MA = Medicare Advantage; NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation; T2DM = type 2 diabetes mellitus; VTDR = vision-threatening diabetic retinopathy

GOOD DOCUMENTATION IS COMPREHENSIVE CODING

In CMS-HCC V28, **severe NPDR, PDR, and qualifying parallel diabetes codes may support HCC 298 — Severe Diabetic Eye Disease (RAF 0.336, CNA segment)**. Accurate capture requires documentation of the **four coding axes: diabetes type, retinopathy severity, macular-edema status, and laterality**, along with current disease status, treatment, monitoring, and follow-up.

Mild and moderate NPDR without macular edema do not support HCC 298. Code the documented stage accurately and **do not upcode**.[2,4,5]

4 TREATMENT AND REFERRAL QUICK GUIDE

*Diabetic eye disease treatment is usually **ophthalmology- or retina-specialist directed**, while primary care supports **early recognition, urgent referral, systemic risk-factor control, medication safety, adherence, and closed-loop follow-up**. Severe NPDR, PDR, center-involved DME, retinal detachment, vitreous hemorrhage, and neovascular glaucoma require prompt escalation. PCPs should document **retinopathy stage, DME status, laterality, treatment status, visual symptoms, and the confirmed follow-up plan**.*[2,5,31,24]

Therapy Escalation Criteria

TRIGGER	ACTION
No DR or mild NPDR	Continue retinal surveillance and optimize **HbA1c, BP, lipids, kidney risk, smoking cessation, and adherence**. Confirm the next eye-exam interval[2,5,30,45]
Moderate NPDR	Arrange ophthalmology follow-up, generally within **6–9 months**, and use closed-loop referral tracking. Intensify systemic risk-factor management[2,5,40]
Severe NPDR	Arrange **urgent retina referral within 2–4 weeks**. Document laterality, 4-2-1 findings, symptoms, referral completion, and follow-up interval[2,5,39]

TRIGGER	ACTION
Any PDR	Arrange **immediate retina-specialist referral** for treatment planning. Document neovascularization, hemorrhage, retinal detachment, macular involvement, and active therapy[2,5,21,27]
Center-involved DME with visual impairment	Expedite retina evaluation for **anti-VEGF or other specialist-directed treatment**. Track visual acuity, OCT findings, and response[2,46]
Initiating GLP-1 RA, insulin intensification, or any rapid glycemic lowering in patients with HbA1c >10% or known moderate-to-severe NPDR/PDR	Evaluate for **early worsening of diabetic retinopathy**. Confirm retinal status and coordinate with ophthalmology before further rapid dose escalation[5,19,20]
Painful red eye with elevated IOP or iris neovascularization	Suspect **neovascular or acute angle-closure glaucoma**; arrange emergency pressure-lowering treatment and urgent glaucoma/retina assessment[21,22,23]
New floaters, flashes, curtain-like field loss, or sudden vision loss	Treat as possible **vitreous hemorrhage, retinal tear, detachment, or vascular occlusion**; arrange same-day or emergency ophthalmic evaluation

ABBREVIATIONS: ADA = American Diabetes Association; AI = artificial intelligence; CI-DME = center-involved diabetic macular edema; DR = diabetic retinopathy; ED = emergency department; EHR = electronic health record; GLP-1 RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; IOP = intraocular pressure; LENS = LENS trial (Logue/Preiss 2026); NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation

AAO PPP 2024 + ADA 2026 + Endocrine Society–Aligned Treatment by Patient Profile

CATEGORY	RECOMMENDED AGENT/ APPROACH	KEY NOTES
Glycemic control	Individualize HbA1c goals: typically **<7.0–7.5%** for most adults and **8.0–8.5%** for frail older adults with limited life expectancy, high hypoglycemia risk, or complex comorbidity. Use **gradual intensification** in patients with severe NPDR or PDR	Rapid HbA1c reduction may trigger **early worsening of diabetic retinopathy**. Coordinate retinal follow-up before or during major treatment intensification in high-risk patients[19,20]
Blood pressure	Target approximately **<130/80 mmHg** when tolerated; individualize systolic targets in frail adults. Use an **ACE inhibitor or ARB** when albuminuria is present	Review **orthostasis, falls, kidney function, and adherence**. Avoid excessive BP lowering in vulnerable older adults[5,15,30,31]

CATEGORY	RECOMMENDED AGENT/ APPROACH	KEY NOTES
Lipids and fenofibrate	Use **statin therapy according to cardiovascular risk**. Consider fenofibrate in selected patients with existing DR and appropriate renal function	Fenofibrate may slow DR progression. Review **eGFR, liver enzymes, myopathy risk, and drug interactions**[40,41]
Anti-VEGF intravitreal injections	Retina-directed **aflibercept, ranibizumab, faricimab, or bevacizumab** for center-involved DME with visual impairment or PDR. Consider FDA-approved ophthalmic biosimilars, including **Yesafili®, Opuviz™, Ahzantive®, and Cimerli®**, when appropriate	Monitor visual acuity, OCT response, injection burden, and missed visits. **Select therapy based on efficacy, cost, access, and follow-up reliability. Biosimilars may improve affordability; bevacizumab is generally lowest cost but remains off-label for ocular use**[2,46]
Panretinal photocoagulation (PRP)	Use for **high-risk PDR** and selected severe NPDR under retina-specialist direction	PRP may be preferable when **loss-to-follow-up risk is high**, but can reduce peripheral or night vision and may worsen DME[42,43]
Intravitreal corticosteroids (dexamethasone implant, triamcinolone)	Consider **dexamethasone implant or triamcinolone** for persistent DME when anti-VEGF response is inadequate or unsuitable	Avoid or use cautiously with **pre-existing glaucoma, ocular hypertension, or significant cataract risk**. Monitor IOP and lens status[33]
Vitrectomy	Retina-surgical treatment for **non-clearing vitreous hemorrhage, tractional retinal detachment, or combined tractional/ rhegmatogenous detachment**	Urgency increases with **macular involvement, progressive traction, recurrent hemorrhage, or severe visual decline**[48]
GLP-1 RAs in patients with baseline DR or HbA1c > 10%	Obtain retinal evaluation **before or near treatment initiation** and use gradual dose escalation when feasible	The main concern is the **speed of glycemic improvement**, not established direct retinal toxicity. Coordinate ophthalmology follow-up when baseline DR is advanced[5,19,20]

ABBREVIATIONS: ACEi = angiotensin-converting enzyme inhibitor; ADA = American Diabetes Association; AMD = age-related macular degeneration; anti-VEGF = anti-vascular endothelial growth factor; ARB = angiotensin receptor blocker; BP = blood pressure; CI-DME = center-involved diabetic macular edema; CV = cardiovascular; DME = diabetic macular edema; DR = diabetic retinopathy; ETDRS = Early Treatment Diabetic Retinopathy Study; EWDR = early worsening of diabetic retinopathy; eGFR = estimated glomerular filtration rate; FDA = Food and Drug Administration; GLP-1 RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; HR = hazard ratio; IOP = intraocular pressure; LDL = low-density lipoprotein; LENS = LENS trial; LTFU = lost to follow-up; MA = Medicare Advantage; NPDR = nonproliferative diabetic retinopathy; OR = odds ratio; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation; RR = relative risk; SBP = systolic blood pressure; TRD = tractional retinal detachment; UKPDS = UK Prospective Diabetes Study; VBC = value-based care; VF = visual field

CLINICAL PEARL - MAXIMIZE ANTI-VEGF ACCESS

Anti-VEGF therapy remains the preferred first-line treatment for most patients with **center-involved DME** and many patients with **PDR**. **FDA-approved biosimilars** can reduce treatment costs while providing **comparable efficacy and safety**, improving affordability and long-term adherence when clinically appropriate.

Non-Pharmacologic Treatment and Lifestyle Modification

INTERVENTION	TARGET/RECOMMENDATION	NOTES
Physical activity	Moderate-intensity activity, individualized for mobility and comorbidities	Modify for **low vision, frailty, and fall risk**[30,45]
Mediterranean-style diet	Vegetables, legumes, whole grains, nuts, and healthy fats	Supports glycemic and cardiovascular risk reduction
Retinal-supportive nutrients	Encourage dietary sources of **lutein, antioxidant vitamins, polyphenols, and flavonoids**. Consider targeted supplementation with ophthalmology guidance	May reduce **oxidative stress and inflammation**. Lutein supports macular pigment and filters high-energy visible light. Small studies suggest improved **contrast sensitivity and color vision**. **Adjunctive only; does not replace glycemic control or standard ophthalmic care**
Smoking cessation	Counseling plus pharmacotherapy when appropriate	Reduces vascular risk and supports overall ocular health[5]
Vitamin D repletion if deficient	Replace according to standard guidance	Supports bone health and fall prevention; **not a direct DR treatment**
Weight management	Individualized, sustainable goals	Avoid overly rapid glycemic change without retinal follow-up in advanced DR[30]
Caregiver and family engagement	Identify support for screening, treatment, and transportation	Confirm who will assist with appointments and urgent symptom recognition[25]
Patient education — "good vision does not mean healthy eyes"	Explain silent disease and urgent warning symptoms	Reinforce that **screening is required even without symptoms**

INTERVENTION	TARGET/RECOMMENDATION	NOTES
Overnight low-level light therapy	Consider a light-emitting sleep mask for selected patients with diabetic retinopathy **only in consultation with ophthalmology**	Studied as a method to reduce **retinal oxygen demand during sleep** and potentially slow disease progression. Evidence remains limited, and it should **not replace standard retinal screening or treatment**

ABBREVIATIONS: anti-VEGF = anti-vascular endothelial growth factor; DR = diabetic retinopathy; HR = hazard ratio; LTFU = lost to follow-up; OR = odds ratio; PCP = primary care provider; PREDIMED = Prevención con Dieta Mediterránea (trial); RR = relative risk; T2DM = type 2 diabetes mellitus

Medication Safety and Key Interactions

DRUG/CLASS	INTERACTION/TOXICITY	CLINICAL ACTION
GLP-1 RA in severe NPDR/PDR or HbA1c >10%	Rapid HbA1c reduction may be associated with **early worsening of DR**	**Obtain retinal evaluation before or concurrent with initiation;** use gradual dose titration[5,19,20]
Insulin intensification with baseline severe NPDR/PDR	Rapid glycemic improvement may temporarily worsen established DR	Coordinate with ophthalmology and monitor for new visual symptoms[5,19,20]
Fenofibrate with CKD or concurrent statin therapy	Requires **renal-dose review**; combination therapy may increase **myopathy risk**	Verify product-specific dosing by **eGFR**; avoid in severe renal impairment and monitor **renal function, liver enzymes, and muscle symptoms**[40,41,47]
Metformin with eGFR <30	Increased lactic-acidosis risk; dose adjustment at eGFR 30–45	Discontinue below eGFR 30; reduce or reassess dosing at eGFR 30–45[24]
SGLT2 inhibitor in CKD/DM	Volume depletion and genitourinary adverse effects	Monitor renal function, hydration, BP, and sick-day instructions[24]
Intravitreal corticosteroids	May worsen **glaucoma, ocular hypertension, or cataract**	Confirm IOP and glaucoma status; coordinate pressure and lens monitoring[33]
Aspirin in diabetic retinopathy	Does not increase clinically meaningful retinal hemorrhage risk at standard doses	Do not stop indicated aspirin solely because DR is present[5]

DRUG/CLASS	INTERACTION/TOXICITY	CLINICAL ACTION
Anti-VEGF agents	Rare ocular infection; potential systemic vascular concerns	Reinforce urgent endophthalmitis symptoms; coordinate with retina specialist and review recent vascular events[2,46]

ABBREVIATIONS: ADA = American Diabetes Association; anti-VEGF = anti-vascular endothelial growth factor; CKD = chronic kidney disease; CV = cardiovascular; DM = diabetes mellitus; DR = diabetic retinopathy; eGFR = estimated glomerular filtration rate; EWDR = early worsening of diabetic retinopathy; FDA = Food and Drug Administration; GLP-1 RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; HCPCS = Healthcare Common Procedure Coding System; IOP = intraocular pressure; KDIGO = Kidney Disease: Improving Global Outcomes; LFTs = liver function tests; NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy; RR = relative risk; SGLT2 = sodium-glucose cotransporter-2
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

When to Refer

CRITERION	SPECIALIST	URGENCY
Sudden painless monocular vision loss; painful red eye with elevated IOP/fixed pupil; flashing lights with curtain-like field loss	Emergency Department/on-call ophthalmology	**Immediate**
Newly identified PDR (any) or high-risk PDR	Retina specialist	**Immediate—within days**
New or worsening CI-DME with vision impairment	Retina specialist	**Urgent—within 2 weeks**
Newly identified severe NPDR (4-2-1 rule)	Retina specialist closed-loop referral	**Urgent—within 2–4 weeks**
New floaters or "spider-web" vision with known PDR/severe NPDR	Retina specialist	**Urgent—within 24–48 hours**
Early worsening after rapid glycemic intensification	Retina specialist	**Urgent—within 1–2 weeks**; pause further rapid escalation pending review
Iris neovascularization detected on exam	Retina specialist and glaucoma specialist	**Urgent—within 24–48 hours**
Moderate NPDR on most recent ophthalmology visit	Ophthalmology	**Routine—every 6–9 months**

CRITERION	SPECIALIST	URGENCY
Mild NPDR or no DR with controlled risk factors	Ophthalmology	**Routine—annual**
Albuminuria >300 mg/g or new eGFR <30 mL/min/1.73 m^2	Ophthalmology; expedited retinal evaluation	**Expedited—within 4 weeks**
Frail patient with PDR and high loss-to-follow-up risk	Retina specialist; shared treatment planning	**Expedited—within 2–4 weeks**
Coexisting PDR/DME and glaucoma requiring intravitreal corticosteroids	Retina and glaucoma specialists	**Routine—within 2–4 weeks**

ABBREVIATIONS: ACR = albumin-to-creatinine ratio; anti-VEGF = anti-vascular endothelial growth factor; CI-DME = center-involved diabetic macular edema; CKD = chronic kidney disease; DME = diabetic macular edema; DR = diabetic retinopathy; ED = emergency department; eGFR = estimated glomerular filtration rate; IOP = intraocular pressure; LTFU = lost to follow-up; NPDR = nonproliferative diabetic retinopathy; PCP = primary care provider; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation

Follow-Up Timing

STAGE/CATEGORY	FREQUENCY	LABS TO MONITOR
No DR on most recent exam	Annual dilated exam; every **1–2 years** only if low risk and reliable follow-up	HbA1c, BP, lipids, urine ACR, eGFR; review visual symptoms annually[2,5]
Mild NPDR	Annual ophthalmology	HbA1c, BP, lipids, ACR/eGFR; reinforce glycemic and BP control[2,5,40]
Moderate NPDR	Ophthalmology every **6–9 months**	HbA1c, BP, lipids, ACR/eGFR; monitor for new DME or visual decline[2,5,40]
Severe NPDR	Retina specialist every **3–6 months; more often if progressing**	Visual acuity, OCT as indicated, HbA1c, BP, ACR/eGFR; confirm referral completion[2,5,17]
Any PDR	Retina specialist every **3 months or per treatment cycle**	Visual acuity, OCT/imaging, treatment status, missed visits, neovascularization[2,5,17]
CI-DME on anti-VEGF	Retina specialist per induction cycle, often every **4–6 weeks initially**	Visual acuity, OCT, injection response, treatment burden, missed appointments[2,3,46]
Frail patient with PDR and poor adherence	Retina follow-up every **1–3 months**; PCP checks between visits	Functional status, transportation, caregiver involvement, treatment completion[25,27]

STAGE/CATEGORY	FREQUENCY	LABS TO MONITOR
GLP-1 RA initiation/ intensification with baseline DR or HbA1c >10%	Retinal evaluation before or near initiation; follow-up within **4 weeks** if retinal review is delayed	HbA1c trajectory, new visual symptoms, confirmed ophthalmology appointment[5,19,20]

ABBREVIATIONS: ACR = albumin-to-creatinine ratio; anti-VEGF = anti-vascular endothelial growth factor; AI = artificial intelligence; BP = blood pressure; CI-DME = center-involved diabetic macular edema; DME = diabetic macular edema; DR = diabetic retinopathy; eGFR = estimated glomerular filtration rate; GLP-1 RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; LENS = LENS trial; NPDR = nonproliferative diabetic retinopathy; PCP = primary care provider; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation

Comorbidity Management

COMORBIDITY	APPROACH	CAUTION
Chronic kidney disease	Continue SGLT2 inhibitor when appropriate; track **eGFR and urine ACR**; coordinate renal and retinal care[17,24]	CKD and albuminuria signal **higher DR severity and progression risk**
Hypertension	Target approximately **<130/80 mmHg** when tolerated; use ACE inhibitor/ARB with albuminuria[5,15,31]	Avoid overly aggressive lowering in frail adults with orthostasis or falls
Cardiovascular disease	Use statin and antiplatelet therapy as indicated; optimize vascular risk[5]	Do not stop indicated antiplatelet therapy solely because retinopathy is present
Cataract	Document separately; refer when glare, reading, driving, or ADLs are affected[2,5]	Cataract may obscure retinal examination and coexist with active DR
Age-related macular degeneration	Confirm OCT and comprehensive retinal assessment[10,32,44]	AMD may contribute to central vision loss and complicate attribution to DME
Glaucoma	**Confirm IOP, visual-field follow-up, and medication adherence** — counsel and consider impact on driving.[33,42,43]	Intravitreal corticosteroids may worsen **IOP or glaucoma**
Depression/low vision	Screen mood, function, adherence, and caregiver support[5,29]	Vision loss may worsen isolation, missed visits, and loss of independence

COMORBIDITY	APPROACH	CAUTION
Frailty/cognitive impairment	Screen with Clinical Frailty Scale or eFI; engage caregivers; for patients at high risk of loss to follow-up, **discuss PRP versus repeated anti-VEGF therapy with the retina specialist** and document the shared decision[25,27]	Frailty markedly increases **missed visits and treatment interruption**; confirm caregiver, transportation, and appointment support

ABBREVIATIONS: ACEi = angiotensin-converting enzyme inhibitor; ADA = American Diabetes Association; AMD = age-related macular degeneration; anti-VEGF = anti-vascular endothelial growth factor; ARB = angiotensin receptor blocker; ASCVD = atherosclerotic cardiovascular disease; CKD = chronic kidney disease; CV = cardiovascular; DME = diabetic macular edema; DR = diabetic retinopathy; eFI = electronic frailty index; eGFR = estimated glomerular filtration rate; FFS = fee-for-service; HCC = hierarchical condition category; HEDIS = Healthcare Effectiveness Data and Information Set; HR = hazard ratio; LTFU = lost to follow-up; OR = odds ratio; PDR = proliferative diabetic retinopathy; PHQ-9 = Patient Health Questionnaire 9-item; PRP = panretinal photocoagulation; QoL = quality of life; SBP = systolic blood pressure; SGLT2 = sodium-glucose cotransporter-2; SRF = subretinal fluid; SSRI = selective serotonin reuptake inhibitor; T2DM = type 2 diabetes mellitus; VF = visual field

AAVBC PERSPECTIVE

In older adults, the most effective retinal treatment is one the patient can complete safely. Document frailty, cognition, transportation, caregiver support, and missed-visit risk when coordinating anti-VEGF, PRP, or surgical care. Treatment selection should reflect both retinal disease severity and the patient's ability to sustain follow-up.[5,17,54]

Patient Education and Adherence

Patient education should be **brief, practical, and repeated over time**. Explain the diagnosis, retinal stage, macular-edema status, treatment plan, and expected follow-up in plain language. Reinforce that **good vision does not exclude active retinopathy**. Review urgent symptoms—**sudden vision loss, new floaters, flashes, curtain-like field loss, or a painful red eye**—and when to seek emergency care. Address medication adherence, glycemic and BP control, smoking cessation, fall risk, transportation, and caregiver support. For patients receiving injections or laser treatment, confirm understanding of the **treatment schedule, missed-visit plan, and post-procedure warning signs**.

DOCUMENTATION REMINDER — PATIENT EDUCATION

Document the **retinopathy stage, DME status, laterality, treatment plan, urgent warning signs reviewed, and next eye-care appointment**. Record who participated, materials provided, patient/caregiver understanding, transportation needs, and the plan for missed visits or worsening vision.

Quality Metrics Tie-In

MEASURE	STANDARD	NOTES
Diabetes Care — Eye Exam (HEDIS EED/CMS Star C11)	**Denominator:** Medicare Advantage enrollees **18–75 years** with type 1 or type 2 diabetes **Numerator:** Members who received a retinal eye examination during the measurement year. **Higher is better**	The most directly relevant eye-disease measure. Use **closed-loop referral tracking** and document the eye-care report, DR stage, DME status, laterality, treatment plan, and next follow-up interval[18]
Diabetes Care — Blood Sugar Controlled (HEDIS GSD/CMS Star C12)	**Denominator:** Members 18–75 years with type 1 or type 2 diabetes included in the measure **Numerator:** Members whose most recent HbA1c was **≤9.0%** (or who were not tested, per HEDIS measure specifications). CMS converts the submitted poor-control rate (>9.0% or not tested) into the Star performance measure. **High is better**	Review the **HbA1c trajectory**, not only the current result. In advanced DR, avoid unnecessarily rapid glycemic intensification without confirming retinal follow-up[18,31]
Kidney Health Evaluation for Patients With Diabetes (HEDIS KED/CMS Star C13)	**Denominator:** Members **18–85 years** with type 1 or type 2 diabetes **Numerator:** Members who received both an **eGFR and urine ACR** during the measurement year. **Higher is better**	**CKD and albuminuria signal increased retinal risk**. Abnormal results should prompt confirmation that retinal surveillance and ophthalmology follow-up are current[18,31]
Controlling Blood Pressure (HEDIS CBP/CMS Star C14)	**Denominator:** Medicare Advantage members **18–85 years** with hypertension **Numerator:** Members whose most recent BP was **<140/90 mmHg** during the measurement year. **Higher is better**	BP control supports retinal and cardiovascular risk reduction. Individualize clinical targets in frail older adults with orthostasis or fall risk[18,47]

MEASURE	STANDARD	NOTES
Statin Use in Persons With Diabetes (CMS Part D Star D12)	**Denominator:** Continuously enrolled Medicare Part D beneficiaries **40–75 years** with at least two diabetes-medication fills on unique dates **Numerator:** Members who received a statin fill during the measurement period. **Higher is better**	Supports cardiovascular risk reduction. Review the indication, adherence, tolerability, drug interactions, and statin–fenofibrate safety when both are prescribed[18, 17,24]
Care for Older Adults — Medication Review (HEDIS COA/CMS Star C08	**Denominator:** Medicare Advantage **SNP enrollees ≥66 years** **Numerator:** Members who received at least one medication review by a prescribing practitioner or clinical pharmacist, with a medication list documented during the measurement year. **Higher is better**	Review glucose-lowering therapy, antihypertensives, statins, anticoagulants, ocular medications, renal dosing, interactions, adherence, and treatment burden[18,25]
Care for Older Adults — Pain Assessment (HEDIS COA/CMS Star C09)	**Denominator:** Medicare Advantage **SNP enrollees ≥66 years** **Numerator:** Members who received at least one pain assessment during the measurement year. **Higher is better**	Relevant after injections, laser, surgery, painful glaucoma, falls, or other ocular complications[18,40,47]
MTM Program Completion Rate for Comprehensive Medication Review (CMS Part D Star D11)	**Denominator:** Beneficiaries **≥18 years** enrolled in the MTM program for at least **60 days** who met the plan's CMS targeting criteria **Numerator:** Eligible beneficiaries who received a comprehensive medication review during MTM enrollment. **Higher is better**	Supports medication reconciliation, written action planning, interaction review, adherence assessment, and safer management of polypharmacy and CKD

MEASURE	STANDARD	NOTES

ABBREVIATIONS: anti-VEGF = anti-vascular endothelial growth factor; CBP = controlling blood pressure; CKD = chronic kidney disease; CMR = Comprehensive Medication Review; CMS = Centers for Medicare & Medicaid Services; COA = Care for Older Adults; CV = cardiovascular; DM = diabetes mellitus; DR = diabetic retinopathy; eGFR = estimated glomerular filtration rate; GLP-1 RA = glucagon-like peptide-1 receptor agonist;HEDIS = Healthcare Effectiveness Data and Information Set; KED = Kidney Health Evaluation for Patients With Diabetes; MA = Medicare Advantage; MTM = medication therapy management; NCQA = National Committee for Quality Assurance; SBP = systolic blood pressure;uACR = urine albumin-to-creatinine ratio

DOCUMENTATION REMINDER – TREATMENT DECISION

Document the **retinal diagnosis, severity, laterality, visual symptoms, systemic risk factors, treatment recommendation, clinical reasoning, patient preference, caregiver involvement, and confirmed follow-up plan**. For severe NPDR, PDR, or active DME, record the urgent referral status and the plan to verify completion.

5 CODING REMINDERS AND CASE EXAMPLES

Coding Specificity

ELEMENT	DOCUMENTATION REQUIREMENT
Four-axis specificity	Document **diabetes type, retinopathy severity, macular-edema status, and laterality**. Example: **type 2 diabetes with severe NPDR and macular edema, right eye — E11.3411**[2,5]
NPDR severity	Distinguish **mild, moderate, severe, or unspecified NPDR**. Do not use an unspecified stage when the ophthalmology report identifies the severity[2,4,5]
Macular edema	State **with or without macular edema** and document **center involvement** when known. Do not assume edema from reduced visual acuity alone[2,5]
Laterality	Document **right, left, bilateral, or unspecified eye**. Use unspecified laterality only when the record does not identify the affected eye[2,5]
PDR activity and treatment status	Document whether PDR is **active, stable after treatment, or associated with neovascularization, hemorrhage, or retinal detachment**. Do not infer stability from remote laser or injection history[2,5]

ELEMENT	DOCUMENTATION REQUIREMENT
Retinal detachment	Document whether traction retinal detachment is present, **whether the macula is involved**, and the affected eye
Diabetic cataract	Code **diabetic cataract separately** when clinically documented. Do not substitute a cataract code for active diabetic retinopathy
Mild or moderate NPDR without DME	These stages may not map to HCC 298, but they remain clinically active and should be documented with the correct **stage and laterality**[2,4,5]
E11.9 use	Do not use **E11.9 — type 2 diabetes without complications** when diabetic retinopathy is documented. Replace it with the eye-specific complication code[2,5,6]
Model documentation statement	"Type 2 diabetes mellitus with severe NPDR and center-involved macular edema, right eye; moderate NPDR without macular edema, left eye; under active retina-specialist management"[2,5]

ABBREVIATIONS: ADA = American Diabetes Association; anti-VEGF = anti-vascular endothelial growth factor; DME = diabetic macular edema; DR = diabetic retinopathy; EHR = electronic health record; EWDR = early worsening of diabetic retinopathy; HCC = hierarchical condition category; NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation; T2DM = type 2 diabetes mellitus

Annual Clinical Review and Confirmation

- **Annual review and reconfirmation:** Reassess diabetic eye disease at least annually and whenever new visual symptoms, treatment changes, or ophthalmology findings occur[4,18]
- **Current disease status:** Confirm the **retinopathy stage, DME status, laterality, treatment status, and next ophthalmology interval**
- **Visit modality:** Telehealth may support symptom and adherence review, but it does **not replace a required retinal examination or ophthalmology report**[2,5,12]
- **HCC context:** Severe NPDR, PDR, retinal detachment, and other qualifying disease may support **HCC 298** when accurately documented[2,4,5]
- **Clinical context:** Document current visual symptoms, retinal treatment, systemic risk factors, missed visits, caregiver support, and referral completion[2,5]
- **Avoid rollover:** Do not carry forward "stable diabetic retinopathy" or "history of eye disease" without confirming that the status remains current[2,3,5]
- **Document closed-loop referral status:** Obtain the eye-care report and document the **next visit date, treatment plan, and urgent-return instructions**[2,39]

DOCUMENTATION REMINDER - FOUR-AXIS SPECIFICITY

Document all four required coding elements:
diabetes type + retinopathy severity + macular-edema status + laterality
Do not use **E11.9** when retinopathy is documented, and do not omit macular-edema status or laterality when known.

Good Documentation Is Comprehensive Coding

EHR SHORTCUT/RISK	PREFERRED DOCUMENTATION LANGUAGE
"Diabetic retinopathy"	Type 2 diabetes mellitus with **severe NPDR and center-involved macular edema, right eye — E11.3411**; **moderate NPDR without macular edema, left eye — E11.3392**
"Diabetes, no complications"/ E11.9	Type 2 diabetes mellitus with **severe NPDR and center-involved macular edema, right eye — E11.3411**, and **moderate NPDR without macular edema, left eye — E11.3392**, as documented by ophthalmology on [date]. Urgent retina follow-up is scheduled for [date]
"PDR" with no laterality or DME status	Proliferative diabetic retinopathy, **[right/left/bilateral eye]**, **[with/without macular edema]**, with **[active/stable] neovascular disease**
"Severe NPDR — refer to ophthalmology"	**Severe NPDR, right eye, without PDR.** Urgent retina referral placed; **appointment confirmed for [date]** and referral-completion alert entered
"On semaglutide for diabetes"	Semaglutide [dose] **continued/held pending retinal evaluation** because of new visual symptoms after rapid HbA1c reduction; ophthalmology coordination documented
"Diabetic eye disease, stable"	**Stable PDR, right eye**, after prior [PRP/anti-VEGF], confirmed by ophthalmology on [date]; **next retinal follow-up scheduled for [date]**
"Patient declines anti-VEGF"	Patient declined intravitreal anti-VEGF after discussion of expected benefit, injection schedule, risks of untreated disease, alternatives, and **consequences of delayed treatment**
“History of retinal detachment”	**Traction retinal detachment involving [macula/not macula], [right/left eye]**, under active retina-specialist management

ABBREVIATIONS: ADA = American Diabetes Association; anti-VEGF = anti-vascular endothelial growth factor; DME = diabetic macular edema; DR = diabetic retinopathy; EHR = electronic health record; EWDR = early worsening of diabetic retinopathy; HCC = hierarchical condition category; NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy; PRP = panretinal photocoagulation; T2DM = type 2 diabetes mellitus

Brief Case Examples

SUCCESS — FOUR-AXIS SPECIFICITY + URGENT CLOSED-LOOP REFERRAL

Patient: A 71-year-old man with a 17-year history of type 2 diabetes presents with **10 days of new blurred spots in the right visual field**. Ophthalmology 3 weeks earlier documented **severe NPDR with center-involved DME, right eye**, and **moderate NPDR without DME, left eye**. HbA1c decreased from 10.6% to 9.4% after semaglutide initiation; eGFR is 48 mL/min/1.73 m^2 and urine ACR is 312 mg/g.

Documentation: Type 2 diabetes mellitus with severe NPDR and center-involved macular edema, right eye — E11.3411; type 2 diabetes mellitus with moderate NPDR without macular edema, left eye — E11.3392." New right-eye symptoms raise concern for **early worsening of diabetic retinopathy after rapid HbA1c reduction**. Urgent closed-loop retina referral placed; appointment confirmed within 5–7 business days, spouse notified, transportation arranged, and referral-completion alert entered. Further semaglutide titration held pending retinal evaluation. Fenofibrate was initiated using **product-specific renal dosing**, with renal function, liver enzymes, and muscle symptoms scheduled for monitoring; BP therapy intensified. CKD stage 3a with albuminuria documented and linked to diabetes.

Outcome: Documentation captures the **four coding axes—diabetes type, retinopathy severity, macular-edema status, and laterality**—and supports **HCC 298 / RAF 0.336**. The note also records active monitoring, urgent referral closure, EWDR coordination, systemic risk-factor management, caregiver involvement, and PCP follow-up.

PITFALL — E11.9 DEFAULT + "REFER-ONCE" DOCUMENTATION

Documentation as written: "Type 2 diabetes, on semaglutide and metformin. A1c improved from 10.6% to 9.4%. Reports blurry right-eye vision. Told to follow up with eye doctor." Coded as **E11.9.**

Consequence: The note omits the documented **severe NPDR with center-involved DME in the right eye**, **moderate NPDR in the left eye**, laterality, treatment urgency, and EWDR concern. "Follow up with eye doctor" does not confirm referral completion, and the care team cannot determine disease severity, retinal treatment status, or the required follow-up interval.

RAF Impact: E11.9 does not support HCC 298. The chart may forfeit approximately **$3,495 per patient/year** in illustrative risk-adjusted resources and understate active vision-threatening disease. The missed closed-loop referral also increases the risk of delayed treatment and preventable visual decline.

Fix: Replace E11.9 with: **"Type 2 diabetes mellitus with severe NPDR and center-involved macular edema, right eye — E11.3411; moderate NPDR without macular edema, left eye — E11.3392."** Document the new visual symptoms, suspected EWDR, urgent retina referral, confirmed appointment, caregiver and transportation plan, treatment-intensification decision, systemic risk-factor management, and PCP follow-up to verify completion.

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